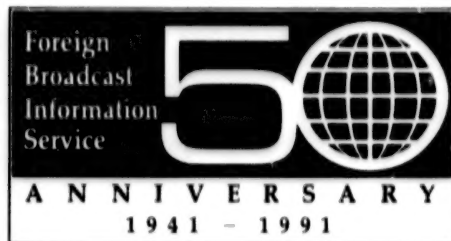


JPRS-TEN-91-011  
17 JUNE 1991



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## ***JPRS Report***

# **Environmental Issues**

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# Environmental Issues

JPRS-TEN-91-011

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### **Gdansk Hosts Baltic Sea Pollution Conference**

*LD1305214991 Warsaw PAP in English 1913 GMT  
13 May 91*

[Text] Gdansk, May 13—An international conference on the pollution of the Baltic Sea started here today with the participation of experts from Denmark, Latvia, Lithuania, Estonia, Russia, Germany and Holland. They are going to discuss joint projects on pollution examination and unification of measurement systems.

### **FRG To Help Latvia on Environmental Protection**

*LD1405124791 Hamburg DPA in German 0843 GMT  
14 May 91*

[Text] Berlin (ADN)—Germany and Latvia intend to begin their own independent joint project for environmental protection. The plans include an exchange of officials to give the Latvian partners an insight into environmental management in the Federal Republic and an increased transfer of technology to the Baltic Republic. This information was revealed by the federal minister for the environment, Klaus Toepfer, and his Latvian counterpart, Indulis Emsis, at a news conference in Berlin on Tuesday following two days of talks. This was the first visit of a minister of the environment from one of the three Baltic republics to Germany.

Toepfer stressed that the Federal Republic is following the developments in Latvia, Lithuania, and Estonia with sympathy. It is important to contribute to the inclusion of this development into a peaceful Europe. The contacts which have been developed are not to deal with questions of the international recognition of Latvia but a contribution to more normality on the continent. He pointed to the fact that the Baltic republics already have official observer status at the Baltic Conference. Until now there has been no reaction from the Soviet Government regarding his meeting with Emsis.

The Latvian minister said the pollution of the Baltic waters is the greatest environmental problem in his region. In order to take the burden off the Baltic Sea it is vital to build wastewater treatment plants. At present a large sewage treatment plant, built with German help, is near completion in the city of Riga with its 900,000 population. Latvia wishes to bring about a radical change in its environmental policy by exploiting Western technological progress. In addition to the treatment plant in Riga, there are other examples of the involvement of German firms, the building of a monitoring system to register damage to the environment and the furnishing of a mobile laboratory to measure air pollution for example.

Both ministers agreed that the problem of technology transfer is still unsolved. At present, said Toepfer, all routes go via Moscow. That means that cumbersome machinery has to be used that is often ineffective. A way must therefore be found to secure the transfer of technology economically.

At the end of the year there will be an environmental symposium for the three Baltic republics in Riga at the invitation of the Federal Republic, dealing particularly with modern measurement techniques.

### **Chinese Official Calls for Protecting Global Environment**

*OW1405062791 Beijing XINHUA in English  
0604 GMT 14 May 91*

[Text] Helsinki, May 13 (XINHUA)—Social and economic development must be based on sustainable natural resources and a favorable ecological environment, Lu Youmei, the Chinese vice minister of energy said today.

The protection of the global environment could only be achieved in concert with social and economic development, he added.

Lu was speaking here at the senior expert symposium on electricity and the environment.

He pointed out that the industrialized countries which were rich in financial and technological resources should contribute more to the improvement and protection of the global environment.

As one of the keynote speakers, the Chinese vice minister also stressed that developing countries should seek measures that could mostly suit their national conditions to control and protect the environment.

This should be within prerequisites of realizing economic growth and controlling population increases.

He said global environment deterioration was closely linked to the unfair and unreasonable international economic order.

It would therefore not be possible to increase the participation of developing countries in global environmental protection and establish a sound mechanism for improving the global environment until a new international economic order was set up.

He said that in facing the ever growing energy consumption, every country had to deal with the question of how to reduce atmospheric pollution and protect the environment when drawing up its national economic development strategy.

He concluded by saying that all developing countries should make their development strategies and energy policies according to their own national conditions. This was to enable them to establish mutual promotion of environment protection and economic development, so as to prosper and narrow the gap with developed countries.

The vice minister also dealt in detail with China's energy policy and some of the measures China had taken.

The symposium was declared open in Finlandia Hall today by Esko Aho, prime minister of the host country. About 300 experts from more than 70 countries are taking part in the event, which will last until May 17. The symposium was arranged by 11 international organizations under the guidance of the International Atomic Energy Agency.

#### **Japanese Committee on Global Environment Launched**

*OW2105093491 Tokyo KYODO in English 0832 GMT 21 May 91*

[Text] Tokyo, May 21 KYODO—Gaishi Hiraiwa, head of the Federation of Economic Organizations, urged Japan's newest environmental group Tuesday to step forward with concrete measures to deal with environmental concerns that threaten the world.

Addressing the high-powered committee he was just elected to chair, Hiraiwa said, "looking ahead to solving global warming and other environmental problems, it is extremely important to create a consensus within Japan and advance concrete measures."

Some 150 politicians, business leaders, academics, and environmentalists met Tuesday to launch the Japanese Committee on the Global Environment.

The committee declared that its purpose will be to "promote efforts made by the whole nation and all sectors of the community for the preservation of the global environment, in full alignment with the government's policies."

Kazuo Aichi, director general of the Environment Agency, stressed the role of the committee in leading Japan toward becoming an environmentally aware society, saying it will be the parent organization guiding changes in business practices and people's lifestyles.

The committee said it will produce an international policy proposal for the June 1992 United Nations conference on environment and development.

Former Prime Minister Noboru Takeshita was elected to the group's 10-member board of advisers.

Hiraiwa said he looked forward to the participation of government officials in the work of the committee.

#### **International Ozone Protection Seminar Opens in Taipei**

*OW2205103191 Taipei CNA in English 0752 GMT 22 May 91*

[Text] Taipei, May 22 (CNA)—A two-day international seminar on the control of chlorofluorocarbons (CFCs) opened today in downtown Taipei.

The seminar attempts to iron out ways to protect the atmosphere's ozone layer, said Hu Teh, director of the Industrial Technology Research Institute's Chemical Industrial Laboratories, sponsor of the seminar.

Four panels will focus discussions on the protection of atmosphere's ozone layer, CFC control policies and their effects on industry, and the recycling of CFCs and the search for new substitutes.

In 1974, scientists for the first time discovered a link between a hole of the earth's ozone layer and the rapid increase of CFCs leaked into the atmosphere.

The earth's ozone, which protects man from the harmful ultraviolet radiation, had declined 10 percent by 1985 and reports of skin cancer had increased 15 percent.

Thirty-seven countries signed the Montreal Protocol in 1987 and promised to cut back on the use of CFCs and then to ban its use before 2000.

The Republic of China is not a contracting party to the protocol but has begun to control the import, production, and consumption of CFCs, Hu said.

Taiwan's CFCs imports fell from 10,159 metric tons in 1986 to 8,857 metric tons in 1990.

Man-made CFCs are used as spray-can propellants, coolants, and industrial solvents.

Also, the department will establish the siting, design, operation, closure, post closure and monitoring requirements for managing hazardous waste disposal facilities.

The Enforcement and Monitoring department encourage recycling, reuse, reclamation and recovery to the maximum extent possible.

Members of the unit will be expected to maintain surveillance and monitoring of dangerous and extremely hazardous wastes and substances until they are detoxified, reclaimed, neutralised or disposed of safely.

To ensure full enforcement of the provisions of the compendium of guideline, the unit will provide the form and rules necessary to establish a system for manifesting, tracking, reporting, monitoring, record keeping, sampling, and labelling.

Meanwhile some staff of the agency will soon be sponsored to the United States of America for a "trainer-trainee" course.

### **Sewage Dumping in Iddo Lagoon To Be Halted**

91WN0431B Lagos *THE GUARDIAN* in English  
8 Apr 91 p 17

[Article by Ifedayo Sayo. First paragraph is introduction.]

[Text] The Iddo Lagoon front, where sewage is tipped daily into the Lagos waters, is listed among unsanitary and hazardous dump sites to be shut down by the environmental protection agency.

Plans are now being concluded by the Federal Environmental Protection agency, (FEPA) to shut down all dump sites in the country that are identified to be "unsanitary or hazardous to human health."

The move is being planned by the agency in line with its roles in the implementation of the new guidelines on environmental pollution control.

The full range of affected sites were not clear last week, but FEPA sources certified that the Iddo Sewage Dump Site in Lagos, where human waste is pumped daily by tankers which collect the waste from several parts of the city, may have been listed among such sites to be affected.

Already, talks are believed to have been initiated between FEPA officials and the state authorities towards the shut down of operations at the lagoon site and the erection of treatment plant in some other safer area of the state to treat the sewage before dumping them into the lagoon.

Environmental researchers had warned that tourists who use the Lagos lagoon for boating and yatching and swimmers as far away as Tarkwa Bay may contact pathogenic bacterias contained in the faecally polluted lagoon.

According to them, the faeces passed into the lagoon contain bacterias and worms which are pathogenic and are able to survive in the brackish water and contact by anyone with the lagoon water system may lead to an infection.

Dr. E.A. Ajao of the Nigeria Institute of Oceanography and Marine Research, (NIOMP), Victoria Island, whose research findings on the rate of pollution in the lagoon by domestic sewage and industrial effluents is positive, said that worms such as tape worm, hook worm and ring worm are pathogenic inhabitants of the intestine which are passed out with faeces, and will survive if disposed into the lagoon untreated.

Though, according to him, tourists do not swim in the lagoon, he said some do use the lagoon for boating and yatching. In such a situation, it is possible for tourists to come in contact with the water and in effect contact these worms which are able to survive in the lagoon.

Also, he said Takwa Bay where many tourists patronize for swimming, may also be dangerous as it receives water from the sea.

According to him if the bacteria in the water from the sea is undiluted, swimmers at Tarkwa Bay face the risk of contacting these bacterias which are injurious to human health.

He however noted that the water reaching Tarkwa Bay has not yet been scientifically confirmed as containing these bacteria, as it may in fact have been diluted as it flows away from the lagoon from the lagoon area.

Corroborating the findings of Dr. Ajao in a joint research carried out on the extent of the lagoon pollution by faeces poured into the lagoon, Dr. V.I. Akpata and Dr. Y.A. Ekundayo of the department of microbiology of the University of Lagos, named three injurious bacterias that are contained in the human intestine and which are passed out with faeces, and are deposited into the faecally polluted lagoon. These are salmonella typhi, salmonella flexneri and escherichia coli.

These three bacterial species, according to them, are pathogenic and constitute risk to human health and their survival in the water is therefore important from the public view.

They said organic water in the sea favoured their survival which makes it possible for them to multiply and therefore constitute a great risk to tourists, on the Lagos lagoon, who may contact them through boating or yatching.

The research effort traced the history of the creation of the Iddo Dump Site by the state government. According to them, faeces discharged into the lagoon is supposed to be washed out into the sea and diluted into extinction. However, there is no scientific proof to show that the faeces organisms are diluted in the sea.

The installation of a treatment plant to treat the sewage before discharging them into the lagoon was recommended as a means of addressing the problem.

In the alternative, Dr. Ajao, in his recommendation called for the laying of pipes from the point sources from where faeces will be pumped into the ocean so that its effect will not be felt in the immediate environment.

### **Government Grants States Funds To Combat Erosion**

91WN0431C Lagos *SUNDAY TIMES* in English  
7 Apr 91 p 3

[Article by Tunde Scott-Owikhoh]

[Text] Seven states—Rivers, Akwa-Ibom, Cross River, Ogun Bendel, Lagos and Ondo—are to receive N512.5 million from the Federal Government to combat the menace of flood and erosion.

Also, areas along the nation's 800-kilometre coastline are to benefit from the new initiative.

Such coastal areas are Burutu, Bomadi, Patani, Ogulaha, Ndiama, Abari, Adagbabri, Ayakoromo, Ogolomor and Tuomor in Bendel State, George Ama, Ogu, Buguma, Bille, Nembe, Kulla, Odiama and Akassa in River State.

Others are those of Aiyetoro, Odonla, Odofado and Jirinwo in Ondo State, Okoro-Ete, Mkpanak and Essiet-Ufot in Akwa-Ibom.

Already, problems in areas, such as those of Maroko and Eti-Osa in Lagos State, Iwopin in Ogun State and Eniong group of villages in Rivers State, have been identified for solution.

Dependable sources from the Federal Ministry of Works and Housing told the *SUNDAY TIMES* that even though contracts for the erosion control are yet to be awarded, work would begin as soon as funds were made available by the government.

But meanwhile, it was reliably gathered that what the government is concerned with presently is the speedy completion of the N108.9 million contract awarded last year for control of erosion in places such as Awoye and Ago-Nati, in Ondo State. Ute Bramah and Inusa Abasi, in Akwa Ibom State, and Sangana and Bonny, in Rivers State.

Last year, the government awarded a N373 million contract to a consortium of three contractors to control flood and erosion arising from the constant surges along the coastline at the Bar Beach in Victoria Island, Lagos.

The scope of work includes:

- Detailed geo-technical investigation, laboratory tests and survey;
- Hydraulic sand-filling with five million cubic metres of approved sand obtained from a pit.



### State Council Approves Five Oceanic Nature Preserves

91WN0401A Beijing ZHONGGUO RENMIN GONGHEGUO GUOWUYUAN GONGBAO [PRC STATE COUNCIL BULLETIN] in Chinese No 22, 25 Dec 90 p 820

[Document entitled "The State Council's Response to the Creation of National-Class Oceanic Nature Preservation Zones—State Correspondence (1990) No. 83"]

[Text] State Oceanographic Bureau:

Your request for "Instruction on the Examination and Approval of the Creation of Nation-Class Oceanic Nature Preservation Zones" (State Oceanographic Administration Document (1989) No. 564) has been received. Our response is as follows:

1. We hereby agree to the creation of the following five national-class oceanic nature preservation zones:

The Changli Gold Coast Nature Preservation Zone (Changli County, Hebei)

The Shankou Redwood Ecological Nature Preservation Zone (Jepu County, Zhuang Autonomous Region, Guangxi)

Dazhou Island Oceanic Ecological Nature Preservation Zone (Wanning County, Hainan Province)

Sanya Coral Reef Nature Preservation Zone (Sanya City, Hainan Province)

Nanji Liedao Oceanic Nature Preservation Zone (Pingyang County, Zhejiang Province)

2. The construction and administration of the above oceanic nature preservation zones will be the State Oceanographic Bureau's responsibility. Other relevant departments and local governments should offer their support and cooperation.

State Council

30 September 1990

### State Council Approves Environmental Protection Proposals

91WN0401B Beijing ZHONGHUA RENMIN GONGHEGUO GUOWUYUAN GONGBAO [PRC STATE COUNCIL BULLETIN] in Chinese No 26, 28 Jan 91 pp 962-963

[Document entitled "Circular Transmitted by the General Office of the State Council Regarding the Environmental Protection Commission's Suggestions on Actively Developing the Environmental Protection Industry—General Office of the State Council (1990) No. 64"]

[Text] To the Provincial, Autonomous Regional, Municipal People's Governments and All State Council Ministries and Commissions and Directly Affiliated Organs:

The State Council's Environmental Protection Commission's "Several Suggestions on Actively Developing the Environmental Protection Industry" has been approved by the State Council and is hereby transmitted to you for implementation.

General Office of the State Council

5 November 1990

### State Council Supports Environmental Protection Industry

91WN0401C Beijing ZHONGHUA RENMIN GONGHEGUO GUOWUYUAN GONGBAO [PRC STATE COUNCIL BULLETIN] in Chinese No 26, 28 Jan 91 pp 963-965

[Document: "Several Suggestions on Actively Developing the Environmental Protection Industry"]

[Text] The Environmental protection industry is the name given to all activities in the national economy, including technology development, goods production, commodity circulation, natural resource utilization, provision of information, and project contracting, the main purpose of which is to prevent environmental pollution, improve the ecology, and conserve natural resources. This refers mainly to the manufacturing of machinery and equipment to protect the environment, the development and management of nature preserves, environmental construction projects, and environmental protection services. The Environmental protection industry is the material and technological base for protecting and improving the environment and for preventing pollution and other damage to public properties. After more than a decade of development, China's environmental protection industry has begun to take shape and has provided many products and services to protect the environment and has made important contributions. To give full play to the return on investments in environmental protection, guarantee the achievement of environmental protection goals, and protect and invigorate the national economy, we must actively develop China's environmental protection industry. In particular, we would like to make the following suggestions:

1. People's governments and relevant departments at all levels must understand fully why developing the environmental protection industry is so important to the prevention of environmental pollution and to the preservation of the ecosystem. In the spirit of the State Council's "Key Decisions on Current Industrial Policy," the development of the environmental protection industry should be given priority during the readjustment of the industrial structure. We should strengthen leadership, create the right conditions, and actively support and guide the development of the environmental protection industry.

2. The guiding principle in developing the environmental protection industry mandates that during rectification and improvement and through reform we improve the quality of environmental protection products and environmental projects and provide the material and technological safeguard for protecting and improving the environment and preventing and treating pollution and damage to other public properties.

3. Environmental protection industries and products which most urgently need to be developed today are advanced, reliable, economical, and efficient atmospheric pollution control equipment, water pollution control equipment, solid waste disposal and treatment facilities, facilities for comprehensive utilization of waste resources, noise and vibration control equipment, water and energy conservation equipment; environmental protection technologies and equipment for the electronics, bioengineering, and high-tech industries; chlorine, fluorine, and hydrocarbon substitutes, and equipment to recover and reuse those gases; emergency equipment to clean up accidental spills; all kinds of specialized environmental protection materials; environmental projects; agricultural ecology projects; afforestation; techniques for breeding wild, rare, and endangered ornamental and industrial animals and plants.

4. To develop the environmental protection industry, we must rely on scientific and technological advancement. The study and propagation of new technologies, new crafts, new equipment, and new materials to protect the environment should be included in the science and technology strategic plan, the "Spark Plan," and the "Torch Plan." We need to enhance the ability of scientific research departments, institutes of higher education, and enterprises to develop new technologies to protect the environment, increase the link and cooperation between research and development and production, develop a technology market for protecting the environment, open bids for new products and research projects, and turn the results of research and development into productive capacity as quickly as possible.

5. We must give play to the effects of specialized management and economies of scale, promote the contracting of complete lines of services, utilize market mechanisms to aid the mainstay enterprises that produce quality products, are efficient, and are developing in the right direction, as well as units that design, build, and install equipment for universal large and mid-sized environmental engineering projects.

6. We must diligently rectify the production and circulation order of the environmental protection industry. Departments in charge should survey, register, check, and manage by separate categories all existing enterprises and institutions in the environmental protection industry.

We should set up an environmental protection industry quality control system and price standardization system and strengthen the supervision and management of

environmental protection products and equipment and gradually set up several environmental protection product quality control and testing centers, announce the results of random checking and evaluation of products regularly, and appraise product quality to let the superior products eliminate the inferior ones. We need to set standards for the design of environmental projects and standards for checking and accepting finished projects and tighten quality control and check the products more carefully before accepting. Consultation, evaluation, forecast, training, monitoring, and other technical services and nature preservation management activities should be put onto a standardized management track.

7. We must hold steadfast to the general policy of opening up to the outside world and launch international economic and technological cooperation and interchange at many levels and in different formats and bring in and digest foreign advanced pollution prevention and cleanup techniques as well as high-efficiency and low-consumption equipment. We should bid for foreign projects to clean up the environment and preserve the ecosystem and strive to develop more international markets. We should undertake all kinds of technical consulting and engineering design and construction work in foreign countries and regions and vigorously develop the export of environmental protection equipment and labor services.

8. We must tap new sources and vigorously train and recruit college and polytechnic school graduates who majored in environmental studies and specialized technical personnel and other professionals and continue to raise the professional and technical standards of the contingent of environmental protection workers.

9. We must give play to the positive role of the various departments and systems. The existing jurisdictional relationship and management scope will remain unchanged. All relevant departments or systems should formulate their own developmental plans and management measures and carry them out diligently.

As law enforcement and supervisory and management organs, environmental protection administration and management departments at all levels of the people's government are prohibited from running their own directly affiliated environmental protection companies, nor are they allowed to take part in the management of environmental protection products.

10. An Environmental Protection Industrial Development Coordination Group will be set up under the State Council's Environmental Protection Commission to be in charge of formulating an overall development plan and general and specific policies pertaining to the environmental protection industry, and the State Planning Commission has been asked to issue a list of priority products in the environmental protection industry to be developed currently and to coordinate and guide the tasks of various departments.

Attachment: List of Products in the Environmental Protection Industry Targeted for Immediate Development

Environmental Protection Commission of the State Council  
23 October 1990

### **Nuclear Industry Spokesman on Sustaining Safe Environment**

OW2605112891 Beijing XINHUA Domestic Service  
in Chinese 0509 GMT 26 May 91

[By reporters Hu Nianqiu (5170 1628 4428) and Zhuo Peirong (0587 1014 2837)]

[Text] Beijing, 26 May (XINHUA)—China's nuclear industrial system has earnestly implemented policies on environmental protection for more than three decades and has consistently sustained a satisfactory level of a safe nuclear environment.

A spokesman of the China National Nuclear Industry Corporation made the above statement on 25 May at a news conference, which was held in conjunction with the upcoming "World's Environmental Day" on 5 June.

The spokesman said: Since the establishment of our nuclear industry, China has upheld the policies of "safety first" and "prevention and protection first." China's nuclear industrial system has established relatively perfect rules and regulations as well as sound administrative organizations concerning safety and the environment. In addition, with an appropriation of about 10 to 25 percent of the total investment funds, the system has constructed corresponding facilities on safety and environmental protection, and has undertaken a lot of scientific research work on environmental protection.

The spokesman said: From 1981 to 1988, China's nuclear industrial system successively organized nearly 600 scientists and technicians to evaluate levels of radioactivity on 42 of China's nuclear facilities including uranium mines, hydrometallurgy plants, uranium isotope separation plants, nuclear element plants, nuclear fuel waste disposal plants, reactors, plutonium metallurgical and processing enterprises, and nuclear project research units. The results showed that the largest annual radiation dosage that people living around all the nuclear facilities absorbed was below the average annual per capita radiation dosage allowed by the state. The annual radiation dosage most people absorbed was less than 10 percent of the average annual per capita radiation dosage emitted by nature. The total amount of the radiation dosage emitted annually by the whole nuclear industry to the residents living within 80 km of the various nuclear facilities (a total of about 150 million people) was only equivalent to 1/20,000th of the radiation dosage emitted annually by nature to these residents. The effect of China's nuclear environmental radiation is negligible in comparison to other natural and man-made perils.

China's nuclear industrial system has made predictions on the Chinese nuclear environment. According to our development plan, China's mainland will have completed construction of nuclear power stations with installed capacity of 6 million kilowatts by the end of the century. By the year 2000, the total amount of the radiation dosage emitted annually by the whole nuclear industry to the residents living within 80 km of the various nuclear facilities will be equivalent to only 1/10,000th of the radiation dosage emitted annually by nature to these residents. This proves that the development of nuclear power in China will not produce radioactivity-related environmental problems.

### **Nuclear Facility Radiation Leakage Less Than National Standards**

OW2705074891 Beijing XINHUA in English  
0611 GMT 27 May 91

[Text] Beijing, May 27 (XINHUA)—In China, the amount of radiation escaping from all the nuclear facilities into their local surroundings is much less than the specifications required by national standards, according to today's WORKER'S DAILY.

This was unveiled in a report evaluating the quality of the environment around the country's nuclear installations set up in the past 30 years. The report was issued by the China Nuclear Industrial Corporation on May 25, according to the paper.

The evaluation, which is being issued to correspond with World Environment Day on June 5, has been conducted by 600 scientists since 1981 and covered an area of 600,000 square km and a population of 150 million, the paper said.

The scientists found that the radiation levels in most of the nuclear installations in the country just exceed one tenth of that commonly found in nature from such sources as the sun, air, water or soil, the paper noted.

Some Chinese experts attribute the good nuclear environment to the country's nuclear industry's adherence to the policy of "security first" from the very beginning, the paper reported.

Chinese scientists have also made predictions concerning the environment around the country's nuclear power stations, which will have a total installed capacity of six million kw by the year 2000.

Some experts are quoted as saying that nuclear energy is rather clean and that nuclear power stations pollute the environment much less than thermal power plants.

This report is highly appreciated by many Chinese experts who regard it as being very informative, academic and useful, the paper said.



### Official Calls for Stronger Antipollution Measures

HK2705021891 Beijing CHINA DAILY in English  
May 91 p 2

[By staff reporter Huang Xiang]

[Text] Pollution, whether of the air or water, is one of the greatest challenges facing China today.

The leading official from the National Environmental Protection Agency of China urged, in Beijing at the weekend, that effective measures be taken to tackle the worsening situation.

Qu Geping, director of the agency, laid out the environmental problems at a press conference on Friday when announcing that his bureau is to host the Third International Exhibition and Symposium on Environmental Protection in Beijing in April 1992.

Co-organized by the China Society of Environmental Industry and the Hong Kong Modern China Co., the exhibition is aimed at promoting exchanges in environmental technology and facilities between China and foreign countries in order to strengthen the country's ability to tackle the problems, said Qu.

The preparatory work has so far gained support and cooperation from 25 State departments, commissions and agencies, including the Ministry of Construction and the Ministry of Energy, as well as more than 400 mines and enterprises across the country.

Qu said that environment was one of the major issues facing all countries, and that China was also confronted with serious environmental problems. Thus it was imperative that effective measures be taken to introduce and import new technologies, techniques and facilities for pollution control. If not, the planned objective to curb environmental pollution and to improve urban environmental quality would not be attained.

According to Qu, air pollution is still serious in urban areas, especially in the northern cities where coal is commonly used for heating in the winter. Partly as a result of this, acid rain is expanding gradually from northern China to some southern areas.

And he explained that the volume of untreated waste water is increasing with the development of the economy. In recent years, the annual discharge has amounted to more than 36 billion tons, which polluted rivers, lakes and offshore seas and seriously damaged rivers in or near cities.

### Trends of Environmental Science Technology in 1990s

91WN0317A Beijing ZHONGGUO HUANJING BAO  
[CHINA ENVIRONMENTAL NEWS] in Chinese  
Feb 91 p 3

[Article by Bao Qiang [7637 1730]]

[Text] In China, it was not until the early 1970s that Environmental Science Technology began to develop as

an independent and new branch of study. Significant progress has been achieved in almost 20 years of hard work. This is particularly so in the 1980s when the Government started a multidiscipline, multidepartmental and multilevel campaign on certain urgent key technological issues of environmental protection. Important progress has been achieved in the study of consolidated prevention technology of regional environment, consolidated prevention of atmospheric pollution, consolidated prevention of water pollution and the study of recycling city waste water, the study of environmental background coefficient and environmental capacity, the study of the national information and database on environment. Advanced international level or leading world level have been reached in certain areas of study. Moreover, in the Seventh Five-Year Plan, the Government invested over 100 million yuan in the development of key national-level laboratories for environmental study in universities and units such as Beijing University, Qinghua University, Academy of Science's Ecological Study Center, Beijing Normal University, Tongji University. These provide new bases for the experiment and study of environmental science technology.

Of course, generally speaking, in the area of environmental science technology, China is still in the stage of learning from and grasping the existing advanced achievements of other nations. When compared with well developed countries, there is still a big gap as China lags far behind in terms of the extensiveness and intensiveness of the technology. Most of the applied technology in China in the area of environmental science is at a level now that was reached already by developed countries in the early 1970s. At present, environmental experts and environmental economists of a calibre capable of igniting academic and scientific controversies on questions of environment remain to be seen in China. There are still no breakthrough achievements nor uniquely outstanding views on how to solve, in a consolidated approach, environmental problems in certain regions of China or the entire nation.

In the years prior to 1990, the overall strategy of our nation's environmental protection has been that of solving a considerable number of environmental problems relatively easier in nature and relatively less costly through the soft scientific means of strengthening managements and implementation of the correct technological policy. At the same time, campaigns, research and developments were started on relatively more difficult technologies and those which have effects on the overall environments. The interim objectives of the decade from 1990 to 2000 consists mainly of the solving of certain key regional environmental problems of more extensive areas through the integration of management measures and the constant improvements of the corresponding technological support systems. Therefore, for the 1990s, China's environmental science technology should, on the one hand, coincide with achievements and functions

already achieved by environmental protection efforts, and on the other hand, provide effective technological support systems so as to realize the goals of the year 2000. Therefore, the salient features of environmental protection technologies in this period are:

#### A. Research and Development

1. The research into the environmental problems arising from energy resources exploration, development and usage and the research into the technology for the pollution control. Included in this will be the integration of environmental factors into energy systems planning and development so as to reduce the adverse effect on the environment caused by the energy systems. In order to completely solve the environmental pollution problem produced during the process of exploration, development and utilization of energy, it is also necessary to find replacements for mineral fuels, to modify the production processes which can produce wastes, to use advanced combustion technology and to reform pricing and other economic policies.

2. The development of sophisticated pollution-control technologies. This includes the drafting of policy on environmental protection of enterprises, and overall control in the coordinated economic and social developments. It also includes the provision of scientific information and technological support systems to strengthen environmental management, the research into the development of harmless, low-toxic waste, rational exploration and utilization of resources and the recycling technology of waste materials.

3. The study of a typical model area for comprehensive environmental pollution protection, a typical model area for restoration of an ecologically damaged area, and an engineering model of environmental pollution control and prevention technology.

#### B. The Selection and Promotion of the Best Pollution Control and Prevention Technology in Different Industries

1. Environmental protection efforts in the Eighth Five-Year Plan relies on the support from advances made in technology by selecting the best pollution-control technology in various industries with different production technology based on the evaluations of existing technological achievements. These best technologies will be the technological basis for the relevant government departments when drafting pollution control policies and these technologies will be promoted for widespread use by administrative orders.

The best applied technology in the industry should meet the following requirements and conditions:

(1) The skill is well developed and the technology is reliable and is reasonable economically.

(2) It should be the model technology operated normally for at least one year by more than two plants.

(3) The technology should be able to cover a large area and once organized, can be applied to over 60 percent of the enterprises and units within the industry.

(4) The applied technology cannot be replaced by other technological innovations within the next three to five years.

(5) There should be a strong research and development support unit.

#### C. Key academic areas to be supported

##### 1. Environmental Engineering

This includes things that are related to environmental factors such as materials, equipment, structural design and testing, and development of treating reagents.

##### 2. Environmental Biology

This branch of study includes ecology, environmental toxicology, environmental medicine, and certain parts of public health.

##### 3. Environmental Economics

This includes the interaction between man and his environment reflected by economic planning and development, environmental legislations, environmental economic technologies evaluation, and man's understanding of his environment.

To conclude, through the efforts of the 1990s, research achievements will be obtained in environmental science technology. These achievements will be a technological level that is equivalent to international world standards of the mid-1980s, and technologies which have realistic economic goals and application in the foreseeable future. Moreover, at the same time, a set of management procedures and operating mechanism suitable for the peculiar conditions of China can be built on the basis of the evaluation of existing technological achievements and the selection and promotion of applied technology. This is to make sure that the supporting role played by science and technology in environmental protection can be played out fully. By the end of this century, with the development of environmental science technology, the different "value" of the environment as conceived by the environmental protection department and various relevant government departments, as conceived by various social strata, will be improved to a considerable extent. More and more people will come to understand that the continued development of China's economy and the social development relies essentially on the healthy and rational development and utilization of "resources support system" and "environment support system."

It is expected that by the end of this century or early next century, in the development of China's economy, the question of environment will enjoy a truly better position and function than other problems.

**UN Assists Jiangxi in Comprehensive Development**

*OW2105095991 Beijing XINHUA in English  
0651 GMT 21 May 91*

[Text] Beijing, May 21 (XINHUA)—A seminar focusing on critical environmental problems in the mountains, rivers and lakes in south China's Jiangxi Province, which is sponsored by the United Nations Development Program (UNDP), opened today in Beijing.

The three-day seminar is an important part of a project aimed at drafting an integrated development plan for the entire mountain, river and lake region in Jiangxi Province. When completed it will help to finalize the government's master plan for managing development in the region.

The project received 600,000 U.S. dollars in funding from the UNDP, and will be carried out by the United Nations Food and Agriculture Organization.

The so-called "mountain-river-lake project" is the first of its kind in China, and participants in the seminar will prepare a comprehensive five-year action plan for the project which focuses on a river catchment system.

During his address at today's opening ceremony, Roy Morey, the UNDP resident representative, said that as it attempts to raise the country's standard of living, China, the most populated country in the world, faces the tremendous challenge of harmonizing development efforts with environmental management.

Morey noted that this challenge is particularly evident in an area such as Jiangxi Province.

Morey expressed his hope that through the joint efforts of the United Nations and the Chinese Government, conditions will be created for promoting development that is in harmony with the environment.

Representatives from organizations attached to the United Nations, Chinese Government officials and scholars attended the opening session.

## REGIONAL AFFAIRS

**New Zealand Opposition Says Government Softening on French Nuclear Tests***BK2105101291 Melbourne Radio Australia in English  
0803 GMT 21 May 91*

[From the "International Report" program]

[Text] In New Zealand the government is under fire for not following previous procedure in condemning the latest French nuclear tests in the South Pacific. The opposition leader, Mike Moore, says there has been a serious policy reversal and New Zealand's silence about yesterday's test will be interpreted as tacit approval for it. Conservation groups are also angry. In response, Prime Minister Jim Bolger says New Zealand's opposition to French testing remains undiminished. Our Wellington correspondent, Brendon Byrnes reports.

[Begin recording] [Byrnes] It has been the practice for many years for New Zealand to announce nuclear tests in French Polynesia with these being detected by a New Zealand monitoring station in the Cook Islands. Each test announcement was accompanied by criticism of the test and by New Zealand's wish for the testing to end. But Sunday's 60-kiloton explosion announced in Paris under a new more open regime about the testing program drew no comment from the Bolger government in Wellington.

The environmental organization Greenpeace, amongst others, says this indicates a weakening of the Government's opposition to French nuclear testing. Greenpeace claims a French television channel noted the lack of New Zealand protest and interpreted this as indicating reduced concern about nuclear tests.

Opposition Labor party leader Mike Moore says such interpretations will occur if there is a lack of criticism about each test. He says it is expected of New Zealand to protest and failure to do so is a serious policy reversal. But Prime Minister Jim Bolger says New Zealand's concern about French nuclear testing remains unchanged. Mr. Bolger issued a statement earlier this month when the latest testing series began, saying the tests were unwelcome and did not help France's standing as a positive partner in South Pacific affairs. Mr. Bolger said the same stern message was given to former French Prime Minister Michel Rocard, who visited New Zealand three weeks ago, shortly before his resignation.

[Bolger] And I repeat that I made it very clear in the discussions that I had with Prime Minister Rocard that our view was that those tests should not continue; we did not want them in the Pacific. If the French believed that they were so secure instead, well then, there is a lot of scope and space on mainland France. Now, we have not diminished [?one iota] from that position. And I do suggest that to just put out a simple statement every few

days does not make our strength of opposition any stronger, and conversely by not doing it make it any weaker.

[Byrnes] Prime Minister Bolger says with France now announcing the tests, there is [word indistinct] occasion for New Zealand to express its opposition, but a change of procedure does not mean a change of policy. France, he says, would be quite wrong to interpret matters in any other way and that New Zealand remains firmly opposed to nuclear testing in the South Pacific. [end recording]

## CAMBODIA

**Agriculture Ministry Warns Against Forest Depletion***BK2605071091 Phnom Penh SPK in English  
0416 GMT 26 May 91*

[Text] Phnom Penh SPK May 26—The Ministry of Agriculture of the State of Cambodia has recently issued a directive limiting the number of sawmills and forestry products purchasing agencies in the country with the aim of preventing overexploitation of forests.

Forest-rice provinces in the country are entitled to have at most 15 sawmills, while "poorer" provinces are allowed fewer mills according to the local forest potentials.

At present, too many sawmills have been set up in Kompong Cham and Pursat Provinces and Kompomg Som City, which is detrimental to the conservation of forests there.

The ministry said about 300 sawmills have been set up and 400 sawing machines installed throughout the country since the liberation. Each machine could saw at least 2.5 cubic meters of wood a day.

Expressing its concern over the depletion of forests in Cambodia, the ministry said forest area in the country has been reduced from 13 million hectares (a pre-war figure) to only seven million hectares at present due to forest depletion.

The English language Thai paper THE NATION said the Khmer Rouge had overexploited the forests for timber sale to Thai companies.

THE FAR EASTERN ECONOMIC REVIEW wrote an article on January 12, 1989 on forest losses in Cambodia, saying that every year the forest area in the country was reduced by 0.3 percent of 25,000 hectares.

Such illegal trade, which is estimated to be worth 4 billion dollars to 6 billion dollars annually around the world, is criticized by scientists and environmental activists as quickening the already-appalling pace of extinction of wild animals.

Some scientists estimated that up to a million species will disappear by 2000.

That would mean the loss of one type of animal or plant every six minutes.

## MALAYSIA

### Western Anti-Tropical Logging Campaign Criticized

*BK2705102691 Kuala Lumpur Voice of Malaysia in English 0800 GMT 27 May 91*

[Station Commentary]

[Text] For several years now Sarawak has been the target of criticism of foreign environmentalists. They claimed to be championing the cause of the Penans [native tribe] in Sarawak and the preservation of tropical rain forests in the state.

The so-called environmentalists, mainly based in Europe, continue to harp even today on what they call indiscriminate logging activities. But these loggers are ignorant or choose to ignore the real state of affairs in Sarawak. Contrary to what they claimed, the Sarawak State Government has spared no efforts in getting the Penans into the mainstream of the society.

As Prime Minister Datuk Sri Dr. Mahathir pointed out, the main aim is to improve the livelihood of the Penans. Measures such as provisions for health, educational, and agricultural services have been taken to help them. Dr. Mahathir has time and again stressed the point that the Penans are Malaysian citizens who deserve a chance to progress. However, the environmental groups are bent on carrying out their anti-tropical timber campaign based on sentiments and irrationality. Another question also arises when these groups called for a boycott on tropical timber import. One wonders whether their move to cut imports is based on trade factors such as fearing losing their markets or based on sound facts.

But the fact stands that Malaysia has been commended with having a strong forest management policy with emphasis on replanting. What is evident is that Malaysia has the greater proportion of its claim unopposed than countries where these groups are based.

In some of these countries where the groups are based, logging destruction was the highest in the world. This being the case, where, then, is their rationale for their accusations? Malaysia still depends on a lot of commodities. Timber is a major source of revenue but it is also pushing to further develop its industrial sector. But as in all development plans, it will take time. This the groups

do not also seem to understand. There is a lot industrialized countries could do to help Malaysia reduce its logging activities. They could increase their imports of downstream timber products; also, they could invest in setting up plants in Malaysia producing value-added timber products. So simply pointing the finger at Malaysia is not going to do anybody any good.

Another important point to note is that some of the environmentalists saw the Penans as a subject for their study. They then travel around the world deriving income from giving lectures on the subject. In the process they tarnish Malaysia's image based on assumptions. Here it looks clear, though, that they seem only to promote their own interests.

But the fact is, Malaysia never ignored the interests of its native people. But in countries such as Australia, this is not the game. The natives in Australia had their lands taken away from them without even any compensation. So why aren't the environmentalists in Europe or in other countries championing their cause? Since they are not, it clearly shows they are practising double standards.

No one has the right to tell the state of Sarawak to stop logging. It is their main revenue-generating activity. Otherwise, who is going to provide for the thousands of people who will be unemployed.

## PAPUA NEW GUINEA

### Environmental Damage by Joint Japanese Firm To Be Investigated

*BK1505080291 Melbourne Radio Australia in English 0500 GMT 15 May 91*

[Text] Papua New Guinea's minister for forests, Jack Genia, has ordered a departmental investigation into the operations of the JANGTC—the Japan and New Guinea Timber Company—in Madang Province.

Mr. Genia told Parliament that he believed JANGTC had not fulfilled the environmental obligation of its logging permit. The forests minister was replying to a question from the member from Middle Ramu, (Yapik), who asked for a judicial inquiry into all logging operations in Madang Province, claiming they were causing massive environmental devastation.

His statement to Parliament coincides with plans by the Madang landowners to begin a blockade of JANGTC operations in support of a compensation claim against the company for \$20 million. The (Kogo Maru) people claimed the JANGTC—a Honshu subsidiary—has created an environmental wasteland of their region. JANGTC has cleared and felled 60,000 hectares of virgin tropical rain forests to make cardboard boxes for stereos and televisions.

The (Benard) Timber Inquiry said the company has used what it termed creative accounting to avoid the clearing



of profit in Papua New Guinea for 17 years, thereby avoiding paying royalties and taxes to the people and the government.

The landowners will tomorrow attempt to blockade JANGTC timber operations until their demands for \$20 million in compensation are met.

## THAILAND

### Environment Fund Bill Seen as Priority

91W N0433B Bangkok *THE NATION* in English  
8 Apr 91 p B1

[Article by Oranuch Anusaksathien and Usanee Wong-sawat. Words in italics as published.]

[Text] The government has set a tight deadline of the end of this month for a proposed legal task force to formulate a draft bill that will lead to the creation of an Industrial Environment Fund, a legal source said.

Deputy Prime Minister Snoh Unakul, who is in charge of economic affairs, confirmed over the weekend that the fund would soon be set up to tackle the country's worsening industrial pollution.

According to the source, Snoh called a meeting last Thursday with PM's Office Minister Dr. Phaichitr Uathavikul and a team of legal and environmental experts to primarily discuss amendments to the 1975 law which created and governs the National Environment Board (NEB). The aim is to strengthen the board's planning and executing powers.

They also discussed the setting up of the fund which would be used as a financial instrument in the development of waste treatment facilities.

Snoh said he would soon decide on the composition of the high-powered task force which will likely have Deputy Prime Minister Meechai Ruchuphan, in charge of legal and security affairs, as its chairman.

The meeting has given the task force only 15 days to finish the legal document which will provide the basis for the creation of the fund, added the source.

"It is obvious that the establishment of the fund is an urgent task given the critical pollution problems in Thailand. Environmental protection tops the agenda," said the source.

However, the size of the fund has yet to be determined, but Snoh said three funding sources—namely government budgeting, foreign assistance and a contribution from the private sector—will be mobilized. Snoh said the government would allocate an increased budget for environmental protection as well.

The fund, when set up, will supplement the resources of the NEB which, by then, will have already been empowered to set minimum national environmental safety

standards and to require government offices directly responsible for enforcing the standards to apply them uniformly, Snoh said.

The amendment of the Enhancement and Conservation of National Environmental Quality Act F.E. 2518 (1975), studied by an *ad hoc* committee chaired by veteran attorney-at-law Kanung Ruechai, was finalized at the end of last month.

Among the dominant features of the amendments is the proposed "environment fund." It will be presented to the NEB board of directors, the Ministry of Science, Technology and energy and the Cabinet for approval soon, said the source. It was initially scheduled to be debated in Parliament in the May session.

The proposed task force will determine what types of industries will come under its supervision, a timeframe for the inclusion of these industries into the central treatment system and the management of the fund.

The source said it is likely that the fund would be modelled after the Thailand Development Research Institute's (TDRI) proposal, which was mooted at its year-end conference last year.

Both Snoh and Phaichitr are senior directors of the independent think-tank. Phaichitr was TDRI president until July last year while Snoh still serves as chairman of the TDRI directors.

In its study, the TDRI suggested that an Industrial Environment Fund be set up to control hazardous waste at the source. The fund would provide a vehicle for managing industrial pollution and its future growth at a minimum cost.

In line with the "polluter-pays" principle, the fund will be financed from waste treatment charges set presumptively for each industry and verified subsequently via environmental auditing.

The charge will be set at a level that covers the costs of transport, treatment and disposal of hazardous waste plus a certain profit margin. The research institute proposed the treatment charge at Bt1,000 a tonne plus a 35 percent profit margin.

At the 1991 projected level of industrial hazardous waste (600,000 tonnes), a Bt1,000 per tonne charge would raise Bt600 million, which is only 0.3 percent of the GDP [gross domestic product] contributed by over 17,000 industrial plants that produce the waste.

Factories that are able to produce a lower waste per unit of output will be paid back. This will encourage industries to reduce the volume of solid waste they produce.

Concerned that industries might pass extra costs onto consumers if they were required to improve their operations to comply with new environmental standards, Snoh said the fund might invest jointly with private

companies to develop and run treatment facilities to share the initial investment.

To sidestep the heavy investment involved in running the treatment system, Snoh said many companies would only operate the machines when field inspectors observe their operations.

### Environment Board Office Role, Chief Profiled

91WN0389E Bangkok DAILY NEWS in Thai  
10 Mar 91 p 5

[Excerpt] [passage omitted] The Office of the National Environment Board is responsible for promoting and preserving the quality of the nation's environment. This includes conducting studies and analyzing the quality of the environment so that the results can be used in formulating policies and plans and stipulating lines to promote and protect the nation's environment and solve the environmental problems. Besides the primary duties and responsibilities mentioned above, the National Environment Board is also responsible for monitoring things and giving advice to government units, state enterprises, and the private sector to ensure that their activities meet the environmental standards. It must also serve as a center in coordinating things and carrying on public relations activities concerning environmental activities both here and abroad. Its powers also extend to dealing with complaints and to promoting and supporting studies on the decline in the quality of the environment and the pollution problem.

The secretary general of the Office of the National Environment Board is Athon Suphapodok. He was born on 15 January 1938 in Bangkok. He is married to Phrimphrai Suphapodok. He earned his BA degree in (civil) engineering from Chulalongkorn University in 1960. He earned a master's degree in engineering from Chulalongkorn in 1962 and a master's degree in regional planning from the University of North Carolina in 1970. Work background: 1963-1974—Second-grade civil servant with the City Planning Office and first city engineer with the City Planning Office. 1975-1977—Head of the Environmental Policy and Planning Office, Office of the National Environment Board. 1978-1981—Director of the Environmental Policy and Planning Office, Office of the National Environment Board. 1981-1984—Director of the Environmental Impact Evaluation Division, Office of the National Environment Board. 1983-1984—Acting director of the Environmental Quality Standards Division, Office of the National Environment Board. 1984-30 September 1989: Deputy secretary general of the Office of the National Environment Board. 1 October 1989-present—Secretary general of the Office of the National Environment Board. [passage omitted]

### Doctor Comments on Lead Levels, Standards

91WN0389D Bangkok SIAM RAT in Thai 9 Mar 91  
p 3

[Article by Dr. Aphichet Naklekha, M.D.]

[Text] In the last issue, I said that there is no standard level for lead in gasoline. What that means is that as long

as there is lead in gasoline, no matter how small the amount, scientists feel that this will still pose a danger. The same is true for setting a standard for the amount of lead in the blood of humans.

In 1980, the United States and the industrialized countries of the world stopped setting levels for lead in the blood. Stated another way, no level of lead in the blood is considered safe. Prior to that, the United States and Europe stipulated that blood lead levels must be kept below 25 micrograms per deciliter of blood. But after the second Nance meeting in the United States, doctors found lead poisoning in various forms and concluded that there is no safe level of lead in the blood because over a long time, the lead can threaten the nervous systems of young children even if there is only a trace of lead in the blood.

Today, Thailand continues to adhere to the position that people are safe if the amount of lead does not exceed 40 micrograms per deciliter in children and 50 micrograms in adults. The average lead levels in the blood of people who live in Bangkok and government officials is 30-40 micrograms per deciliter for children living in Bangkok and 40-45 micrograms for adults, which has been considered to be safe levels.

Studies conducted by the Toxic Family Unit group (Aphichet Naklekha, Dr. Phichit Rattakorn, and group team) during the period 10 December 1990 to January 1991 found that the average amount of lead in people who live along busy streets, bus passengers, taxi drivers, and traffic policemen was 54.4 micrograms per deciliter. The average amount in adults who live in five stories was 45.7 micrograms. The results of the study have not yet been published. A random sample of two groups was taken, with 100 people per group.

If Thailand's levels are used as the standard, 110-120 µg/dl don't seem very frightening. But if we look at the status of the second Nance meeting, these figures are alarming. That is:

### Effects on health

Lead levels in children—Four micrograms per deciliter or less. Over a long period of time, the children will develop abnormalities in attention and there is a real growth may be stunted.

Five-10 micrograms per deciliter. Over the long term, the central nervous system will be affected. The children will not be as smart as they should be. There is a clearly decline as compared with the level of children who have very small amounts of lead in their blood in the areas of the United States and Europe.

If lead levels in children reach 10-20 micrograms per deciliter, a warning should be issued. The U.S. Department of Health has recommended that people be kept away from lead levels from reaching this level in children.

and pregnant women. That is, the level should not exceed 10 micrograms per deciliter.

If the level reaches 12-15 micrograms per deciliter, there may be hearing and speech problems and the person's IQ will not be as high as it should be. Women may give birth prematurely, and their babies may weigh less than they should. If the IQ's of children below the age of two decline just four points, their chances of being mentally retarded will be four times greater.

A lead level in children in excess of 20 micrograms per deciliter poses a great threat to their physical and mental health. This level is unacceptable to U.S. doctors. Those at the second Nance Meeting summarized the danger facing American children during the period 1976-80. It was found that the average level of lead in children was only 13.0 micrograms per deciliter, but that, over time, this had a great effect on many of the children, particularly on the nervous system. As a result, doctors in the United States and Europe became more aware and turned their attention to the problem of lead poisoning in children.

It can be said that there is no longer any safe level of lead in children. The ideal level is as close to zero as possible. (In 1988, the average level for American children was less than two micrograms of lead per deciliter of blood. That same year, the level in Thai children was 20-40 micrograms. Thus, it can be seen that we have a crisis here.)

If the level exceeds 25 micrograms per deciliter, the child should be taken to a hospital in order to remove the lead from his blood (Child Protection Bill proposed by the U.S. Environmental Protection Agency and passed into law in 1988).

In adults, if the level of lead in the blood exceeds seven micrograms per deciliter, over a long period of time, those with such lead levels will tend to have high blood pressure more often than those whose lead level does not exceed five micrograms. If the level reaches 10-15 micrograms, pregnant women may have miscarriages or deliver prematurely. The newborn baby is likely to weigh less than 3,000 grams and have a low Apgar score (Normal, healthy children have a score of 10. Children born with lead poisoning have a score of only 7-8.)

If the level reaches 15-20 micrograms, these adults may develop diseases of the kidneys. This could cause the chemical values in the blood to change by 25 or more. The person's brain will degenerate more rapidly than normal, and his memory will begin to fail more quickly. These people may have heart disease or high blood pressure.

At a level of 50-70 micrograms, the red blood cells will divide faster than normal, causing anemia. People will develop symptoms of lead poisoning in the central and lower nervous systems, such as convulsions and numbness in the fingers and toes.

A level in excess of 80 micrograms per deciliter poses a danger to the nervous system, bone marrow, kidneys, liver, ovaries, and testicles. The person usually does not live very long. He is mentally handicapped or permanently disabled. The person has a high chance of developing high blood pressure, diabetes, heart disease, or kidney failure.

Looking at the figures and at the results of the studies conducted abroad and then looking at children and adults in Thailand, particularly those living in Bangkok, it can be seen that, today, besides the dangers posed by other types of pollution, the situation with respect to lead poisoning alone is very frightening and makes us wonder what things will be like here in 10-20 years. Today, Thai children eat food, drink water, and inhale fumes containing 20 times more lead than do children in the United States. Or do Thai children have a greater resistance to lead poisoning than foreigners?

#### **Use of Poison by Suphanburi Fishermen Condemned**

91WN0389C Bangkok DAILY NEWS in Thai  
19 Mar 91 p 25

[Text] Suphanburi Province has many natural sources of water. Many types of fish, including "sawai," "kot," "mo Thai," snakehead, catfish, and "nua on" fish, that can be used as food and that can be exported live in these waters.

Today, some people are catching fish using insecticides and herbicides such as DDT, Asodan, Arisakam, Dildrex, 18 EC, Dilside, and Chloden. These substances are poisonous to both fish and humans. These substances remain in the body for a long time, and they do not break down easily. Some break down, but it takes a long time. These poisonous substances are already present in many fields and water sources. In fish, these substances build up in the fatty tissue of the fish. When people eat such fish, these substances concentrate in the liver, fatty tissue, and other organs of the body. If people consume large amounts of these substances, they could die.

Fish that have been caught using poison can be identified very easily because, just after these fish die, they continue to have muscle spasms, water gushes out of the mouth, and the bodies of the fish turn black. Those who eat these fish may feel nauseous and vomit, and they may become dizzy and confused. If these poisons get through the skin, the person may feel agitated, and he may have muscle spasms and begin shaking. These substances affect breathing, and the person may experience a shortage of oxygen. The person may even die. Anyone who ingests such substances should be taken to a hospital immediately.

If people use insecticides or herbicides to catch fish, besides destroying the aquatic life that live in these water sources, the fish that are caught can't be eaten, because they are poisonous. Those who catch fish this way are violating the law. They will be arrested and prosecuted.



Second Lieutenant Somnuk Koetket, governor of Suphanburi Province, has issued a statement ordering those involved in this to stop. If they continue doing this, resolute action will be taken against them in accord with the law.

### **Incidence of Environmentally Induced Illnesses Outlined**

91W03874 Bangkok KHAO PHISSET in Thai  
18-24 Mar 91 pp 34-38

[Excerpt] [passage omitted] A report issued by the Statistics Division, Office of the Under Secretary of Public Health, mentioned the number of people nationwide who have diseases of a poorly defined nature. The report said that, in the north, a total of 9,534,388 people are sick. Of these, 1,501,804, or 15.85 percent, have ill-defined symptoms, and it is assumed that they have environmentally induced illnesses. In the south, a total of 5,277,615 people are ill. Of these, 689,668, or 13.17 percent, have ill-defined symptoms. In the central region, a total of 9,718,436 people are sick, and 1,503,878, or 15.47 percent, have ill-defined symptoms. In the northeast, a total of 13,556,334 people are ill. Of these, 1,919,593, or 14.16 percent, have ill-defined symptoms.

Besides this, a report from the Environmental Quality Standard Division, Office of the National Environment Board, stated that Thai farmers are the people most likely to ingest poisonous substances from chemicals. Their symptoms often include fatigue, soreness around the waist, pain along the spine, and headaches.

However, even though the symptoms—fatigue, exhaustion, paleness, coughing, sneezing, and chronic colds—are unclear when people first start ingesting chemical substances, breathing car exhaust when traffic is congested, and breathing gases when working in industrial plants, the diseases become serious about 10-20 years later.

The deterioration of the environment poses just as great a danger as other diseases. But people tend to view this as less serious than other diseases or than death from accidents. They see those things daily and so tend to be more afraid of them.

In his capacity as the secretary of the Pollution Control Association, Dr. Wichit Rattakun, a former member of Parliament from Bangkok and deputy minister of science, technology, and energy, talked with KHAO PHISSET about the pollution situation. He said that this is now a crisis and is a very serious problem. In particular, the air quality in Bangkok is very bad. He provided some figures and said that up to 900,000 people a year become ill as a result of this.

"Many people are not yet ill, but they must travel about Bangkok and inhale poisonous exhaust on a daily basis. These people have symptoms relating to the nervous system and brain. They feel tired and sleepy, have

headaches, feel dizzy, and suffer from skin reactions and allergies. This shows that this problem is very serious."

When asked what action the Pollution Control Association is taking, he said that the association has revealed the facts to the 6-7 million people living in Bangkok. These are the people who must bear the effects of this. They have been informed about the dangers of these substances, particularly the poisonous nature of the various substances in the air, so that they can take measures to protect themselves. An effort is also being made to get those who cause pollution, that is, the owners of vehicles, to repair the engines of their vehicles so that they do not create problems for society. Pressure is also being put on those who make laws, that is, the government, to monitor the situation and promulgate laws to protect the 6-7 million people in the city.

"The association has posted warning signs in seven areas where air pollution is very serious and where the situation is expected to grow even worse. This pollution will have a serious effect on the people. It's as if the people who travel in these seven areas were trapped in a gas chamber used to execute people in wartime. Posting warning signs to inform people of the danger is one way to get people to protect themselves. Even though this will achieve only limited results, it's better than not knowing that you are entering a danger zone and unknowingly inhaling poisonous substances. Even people riding in an air-conditioned car will inhale these poisonous substances."

The places where the association has posted "red flags" include Pratu Nam, Ratchaprarot, Yaowarat, Maen Si, Bamrung Muang, Silom, Saphan Khwai, and Wongwian Yai. In the Pratu Nam area, the most recent study of air quality showed that the quality of the air there was worse than anywhere else. Measurements showed that the amount of particles in the air had an index value of 500 (the standard is 100). Another way of saying this is that pollution there is five times higher than the stipulated level. As for the level of carbon monoxide, during the worst eight hours, the average level is 26.6 milligrams per cubic meter (the standard for eight hours is 20 milligrams per cubic meter).

Dr. Sanga Sapsi, the minister of science, technology, and energy, said that vehicles are responsible for most of the pollution in Bangkok. The pollution comes from gasoline containing lead.

"The only way to reduce pollution is to reduce the amount of lead in gasoline. And we must quickly build a mass transit system in order to reduce traffic congestion, which would help to reduce air pollution."

Dr. Sanga said that recently, Mr. Bangs Eriksson, the head of the Swedish Environmental Protection Office, came to see him in order to provide help with the program to reduce air pollution in Bangkok.

As part of this program, Sweden will install air pollution monitoring equipment in four places, that is, in front of

the Ministry of Science, Technology, and Energy, at the Lumpini intersection, on Yaowarat Road, and in front of the Mochit Market. These four monitoring stations will provide the people with data on air pollution and help make them aware of the danger that this poses to their health. The objective is to make the people aware of this and get them to take steps to solve this problem.

It will take about three months to install the equipment. This will cost Thailand approximately 14 million baht, and Sweden will provide another 4 million baht to pay experts. Sweden feels that Thailand is an economically advanced country and so it won't cover the entire cost of the project.

Dr. Luaphon Punnanan, the deputy dean for public relations and communications, Faculty of Medicine, Sirirat Hospital, told KHAO PHISIT that the amount of dust in the air has increased greatly during the past three years. The recorded amounts have reached 200-700 units. WHO considers 300 units to be a high level. In Bangkok, dust levels are quite high. This stems from the heavy traffic in Bangkok. Besides dust, there is also lead and carbon monoxide in the air.

"There are ways to control this. But so far, what has been done has not achieved results," said Dr. Luaphon. He said that the policy is to reduce the amount of lead to 0.15 grams per liter by 1993. This will help reduce environmental pollution, particularly from toxic fumes.

Dr. Luaphon also expressed concern about two-cylinder motorcycles that run on a mixture of engine oil and gasoline. These motorcycles emit a "white smoke" that contains a substance that can destroy the lungs and cause lung cancer.

"The number of people suffering from allergies is increasing, as is the number of people suffering from lung disorders. We are not putting the blame solely on this. But this is probably one of the major causes, because at present the transmission of diseases has declined. Thus, we think that the lung disorders are being caused by pollution. We are also concerned about the sulfur dioxide produced by the burning of engine oil. Fortunately, this isn't a major problem here yet. Levels are still within the limit considered safe. But if it increases, this will cause what is termed "acid rain."

Dr. Luaphon said that each year, Thailand uses about 1,400 tons of lead in gasoline in order to prevent engine knock. When the gasoline is burned, the lead is emitted into the air, and people breathe this polluted air. The way to solve this problem is to remove the lead from the gasoline and use 10-12 percent alcohol instead. Alcohol works just as well, but prices will increase about 3 baht per liter. Thus, it all depends on how responsible our administrators are.

"The tax on gasoline is now about 4 baht. If we put alcohol in the gasoline instead of lead, we can remove the lead. But the state will have to pay more. But this must be compared with the cost of having to treat people

suffering from lead poisoning. Even though the problem is not bad at the moment, it will grow worse and worse. We will have to treat large numbers of people. I think that it is worth it if we compare this to what we will have to spend treating people in the future. That is all I can say. I am just an academic. I can't interfere with others."

Sirirat Hospital took blood samples from the placentas of 100 newborn infants and found that their blood contained levels of lead that could affect their physical and mental development. The level of lead in one infant was high enough to affect his brain. Studies have shown that the average amount of lead in children born in large cities is now 18.5 micrograms per 100 milliliters, which is below the accepted level of 25 micrograms per 100 milliliters. But this does not mean that this amount of lead is safe. The amount is increasing, because air pollution is growing worse every day.

Besides this, studies have been done to compare the amount of lead in the blood of children who live in Bangkok and of children who live in Kanchanaburi Province. For children aged six to eight, only slight differences were found. That is, the amount of lead in the blood of children living in Bangkok was 16-18 micrograms per 100 milliliters as compared with 14 micrograms per 100 milliliters for children in Kanchanaburi. But for children aged 9-13, the amount of lead in the blood of children living in Bangkok averaged 16-19 micrograms per 100 milliliters as compared with 14 micrograms per 100 milliliters for children in Kanchanaburi.

Based on the results of this study, it has been concluded that, unless urgent measures are implemented to control pollution, the problem of lead poisoning among children will continue to grow worse, and medical costs will rise. High lead levels in infants below the age of six months can arrest the mental and physical development of these children. And if the level reaches 30 micrograms per 100 milliliters, the lead will destroy the brain. That is, these children will be weak, and they will have learning disabilities. [passage omitted]

#### **Pollution Controls Considered for Vehicles**

91W/N03894 Bangkok NAEO NA (LOK THURAKIT SUPPLEMENT) in Thai 5 Mar 91 p 14

[Text] Mr. Siowong Changkhasiri, the under secretary of industry, said that clear pollution standards should be set for vehicles and motorcycles. The units concerned, that is the Thai Industrial Standards Institute, the Industrial Economics Division, and the Environmental Office, will be asked to come discuss the matter of setting pollution control standards for cars and motorcycles.

On 4 March, the Vehicle Industry Group and representatives from a Japanese environmental study organization met to look at data from each country to see what vehicle pollution standards have been set.

Mr. Kawi Wasuwat, chairman of the Vehicle Industry Group, said that, during the time that Mr. Pramuan Sapawasu served as minister of industry, he ordered that pollution control devices be installed on all cars. Vehicle manufacturers are very confused by this policy. Because before issuing this order, the first thing that should have been done was to set pollution standards for carbon monoxide and white smoke. Producers will not be able to act in accord with this order. In other countries, the standards are set before producers are ordered to do something.

Mr. Phairoi Phonprapha, the chairman of the A.P. Honda Company, said that with respect to this announcement by the Ministry of Industry, producers will probably take steps to improve motorcycle engines in order to reduce pollution. Studies are now being done, and a motorcycle that emits less pollutants has been produced. It is expected that this will be put on the market sometime in the next two years.

This announcement by the Ministry of Industry, which was issued on 6 February, stipulates that car manufacturers must install pollution control devices on cars that run on gasoline. This is effective 1 January 1992. This is in line with the law requiring that the lead content in gasoline be reduced starting in 1993.

#### **Sweden To Provide Aid on Ocean Pollution**

91W/0389B Bangkok *SIAM RAT* in Thai 12 Mar 91  
p. 3

[Text] The Swedish Royal Academy of Sciences is providing help in order to solve Thailand's problem of ocean pollution. It will apply the lessons that it learned in solving this problem in the Baltic Sea. The minister of science is concerned that the Gulf of Thailand will become a cesspool unless something is done about this problem.

On the morning of 11 March at Chulalongkorn University, a ceremony was held to open a working conference on research concerning ocean pollution in Thailand. This was held in accord with the agreement reached by the Ministry of Science and the Swedish Royal Academy of Sciences. During the talks in June 1990, a resolution was issued calling for scientific activities to be carried on on five fronts: coastal and river pollution, the dangers from herbicides, an evaluation of environmental risks, the problem of waste water and garbage, and biological diversity.

This conference marked the start of the activities. The focus will be on ocean pollution in Thailand. Those at the conference will discuss the research and development situation and the situation in the Gulf of Thailand. Also, the environmental situation will be monitored and evaluated, too. This will be conducted as a project in order to ask for help from Sweden.

At the conference, Dr. Sanga Sapsi, the minister of science, technology, and energy, said that the Gulf of

Thailand is an open sea, and the water there is not very deep. Water currents in the gulf are influenced by currents from the South China Sea during the monsoon season. The upper part of the Gulf of Thailand is a rich fishing ground, but this is now being affected by the use of this sea area, such as ocean transportation. Oil slicks sometimes move here from the South China Sea. Waste water flows into the gulf from various rivers in Thailand and from the South China Sea. Thus, the Gulf of Thailand could become a cesspool unless quick action is taken to solve this problem.

### **VIETNAM**

#### **Government To Restrict Timber Exports**

BK1505095191 Hanoi *Voice of Vietnam Network*  
in Vietnamese 1100 GMT 3 May 91

[Text] The chairman of the Council of Ministers on 30 April issued a decision on the export of timber and other forestry products from 1991.

According to this decision, the chairman of the State Planning Commission together with the minister of forestry and the minister of commerce are to reduce the 1991 timber export quotas in the following ways:

- Reduce the export of hardboards, veneers, and floor planks as stipulated in various protocols. If this cannot be done, timber will be allowed to be exported in the amount stipulated, but no increase will be permitted.
- Strictly control timber exports. Any locality and unit with signed agreements will be allowed to export timber if the localities concerned have carefully considered the matter. Any locality or unit that has been allocated export quotas but is still looking for markets will have its export licenses revoked. In special cases, any locality and unit that would like to export timber must obtain authorization from the chairman of the Council of Ministers.

Forestry cooperation with overseas organizations and individuals must be aimed at securing capital investment and technology for afforestation and the manufacture of products for export.

From 1992 onwards, sectors and localities will be allowed to export only products made of processed timber and other processed forest products. The export of semiprocessed timber and other nonprocessed forestry products will be banned.

#### **Ministry Reviews Forest Protection, Development Program**

BK1905145291 Hanoi *VNA in English* 1335 GMT  
19 May 91

[Text] Hanoi *VNA* May 19—A review on a forest protection and development project has been held here by the Ministry of Forestry. The project has been carried out in Vietnam since August 1, 1989 by the Food and

Agriculture Organization of the United Nations and Vietnam's Ministry of Forestry with financial aid from the United Nations Development Programme and the Swedish International Development Authority (SIDA).

The Soviet Union, Australia and New Zealand have sent specialists to help in the project.

Speaking at the review, Dong Si Nguyen, politburo member of the Communist Party of Vietnam Central Committee and vice chairman of the Council of Ministers, expressed thanks for international assistance to forest protection and development in Vietnam.

After more than 20 months of data collection and study tours, Vietnamese and foreign specialists completed 16 reports and organized 16 seminars. The compilation of reports for the sector review helps to formulate a strategy for forestry development up to the year 2000 in Vietnam, a draft law on forestry, and several projects on the creation of paper material zones, and watershed protection forests around the Hoa Binh Reservoir in Ha Son Binh, the Dau Tieng Reservoir in Tay Ninh, and the Tri An Reservoir in Dong Nai.

The project also covers programmes on environmental protection, fixed cultivation and sedentarisation, land allocation, wood-based fuels, wood and non-wood industries, and institutional development. A seminar is scheduled later this year to call tenders for foreign investment in forestry and environmental protection for the period 1991-95 at an estimated cost of one billion U.S. dollars.

#### **Tran Duc Luong Addresses Conference on Environment**

*BK2105102591 Hanoi Vietnam Television Network in Vietnamese 1200 GMT 17 May 91*

[Text] The first National Conference on Environmental Sanitation and the Environment was held in Haiphong from 13 to 14 May by the Ministry of Construction. Tran Duc Luong, vice chairman of the Council of Ministers, attended and addressed the conferees. Also on hand were Finnish environment and water supply specialists currently working in Haiphong.

At present, more than 12 million people are living in nearly 500 urban centers under polluted conditions where only 40-50 percent of the garbage can be collected daily. The amount of waste material produced by construction work is increasing very rapidly, especially in Hanoi and Haiphong. The cities lack up to 70 percent of the necessary sewage systems, and waste water often stagnates in canals, ditches, and reservoirs, many of which have been seriously polluted, such as the To Lich Canal system in Hanoi and 100 km of canals and ditches in Ho Chi Minh City. In the entire country, only 55 cities have an organization exclusively in charge of sanitation management; in the remaining urban centers, workers of construction offices are the only ones in charge of this task. The lifestyle of city dwellers, who are not taught

about environmental sanitation, has also caused more difficulties for urban sanitation and environmental management.

Statements made by government officials and responsible agencies at the conference shed light on the degradation of urban sanitation and worsening environmental pollution and on the urgent demand for a solution to this problem. Main measures suggested included urban construction planning and management, increased financial sources, measures aimed at consolidating the technical branch of urban sanitation, the application of scientific and technical advances, and the perfection of various laws, regulations, policies, and procedures concerning the urban water supply and drainage, propaganda and educational work, and international cooperation.

Delegates at the conference proposed that the government promptly draft and promulgate a law on environmental protection and urban management to ensure the successful fulfillment of this important task.

#### **World Food Program Funding Afforestation Project**

*BK2105141291 Hong Kong AFP in English 1310 GMT 21 May 91*

[Text] Hanoi VNA May 21—A Vietnamese project on afforestation, code-named 4304, worth 20.3 million U.S. dollars, was approved by the World Food Programme (WFP) at its recent meeting in Rome.

Under this project, WFP will supply more than 115,000 tons of food to the people of 12 provinces who will be involved in afforesting 125,000 hectares on waste land, barehills and coastal areas.

At the meeting, representatives of 12 countries, especially such big contributors to WFP as Britain, France, Australia, Sweden and Italy, spoke in support of Vietnam's project.

#### **Southern Provinces Reforest 400,000 Hectares**

*BK2205123991 Hanoi VNA in English 0605 GMT 22 May 91*

[Text] Hanoi VNA May 22—Since liberation in 1975, the southern provinces have planted 400,000 hectares of forest and more than four billion trees on scattered plots, thus contributing to the greening of hills, producing millions of cubic metres of timber, and restoring the ecological balance.

Long An Province planted 30,000 hectares of cajuput in Dong Thap Muoi (Plain of Reeds).

Ho Chi Minh City replanted 25,000 hectares of mangrove in the outlying district of Duyen Hai which were destroyed by U.S. toxic chemicals and bombs during the Vietnam war.

This year the city plans to grow five million trees in scattered plots and 3,300 hectares of forest.



## REGIONAL AFFAIRS

### Construction of Danube Gabčíkovo Barrage To Continue

*LD2105221291 Prague Czechoslovensky Rozhlas Radio Network in Czech 1600 GMT 21 May 91*

[Text] The Slovak government today approved the report on the talks in Budapest and decided to continue with the construction of the Gabčíkovo water barrage system. This system will be built only on our territory. The final decision will be made following further talks with the Hungarian side.

Slovak government ministers also discussed the state of waste water treatment. The present extent of construction did not take into account Slovakia's extraordinary backwardness in this area and for this reason the quality of surface and underground waters is very unfavorable, in some cases bordering on a catastrophic state. The solution of the problem is being endangered by insufficient funds which do not even enable the completion this year of water treatment plants under construction.

The Slovak government also decided to continue with the modernisation of the Ziar nad Hronom aluminum plant of the SNP enterprise with the use of foreign capital. This option will provide work for the employees of the enterprise for the next 10 years.

## CZECHOSLOVAKIA

### Czech Government Discusses Ecological Issues

*AU2305084791 Prague CESKE A MORAVSKOSLEZSKE ZEMEDELSKE NOVINY in Czech 16 May 91 p 2*

["(bau,vaf)"]-signed report: "The Government on North Bohemia"]

[Excerpts] Prague—At its session yesterday the Czech Government discussed a proposal to implement a set of measures on improving the environment in North Bohemia. In the very near future an important role in this regard could be played by utilizing the experiences of North Rhine-Westphalia where, approximately 10 years ago, problems similar to the ones we now face in North Bohemia were successfully resolved.

The proposal to implement a set of measures on improving the environment in North Bohemia contains a provision on the ecological limits affecting the North Bohemian mining district as a result of new mining and energy activity. Czech Environment Minister Ivan Dejmal gave details on the proposal following yesterday's approval of this document by the Czech Government.

In this connection, the government set the Czech Environment Ministry the task of preparing a draft law on establishing an organ to ecologically supervise mining

activity; this organ will be authorized to categorically define the limits in the North Bohemia region. The government also decided to make a sum of 140 million korunas available to cover a stabilizing allowance for the geographically expanded North Bohemia mining region. This involves sums for the Decin, Louny, and Litoměřice Districts. These resources should be made available as soon as possible, that is, probably in June or July of this year. [passage omitted]

The government also discussed a report on searching for, evaluating, and destroying polychlorinated biphenyls in agriculture in the Czech Republic. As Agriculture Minister B. Kubat said, it is necessary to resolve the whole problem in two stages. First and foremost, it is necessary to eliminate polychlorinated biphenyls from the food chain. This is going well since all butter from afflicted breeds is being stored while the animals themselves are being destroyed and processed into organic fertilizers.

### Assembly Approves Waste Bill

*LD2305023191 Prague CTK in English 1701 GMT 22 May 91*

[Text] Prague May 22 (CTK)—The Czechoslovak Federal Assembly (parliament) today passed a government bill on wastes, the first Czechoslovak legislation on environmental protection since the November 1989 revolution. In bringing Czechoslovak waste regulations in line with international environmental and hygienic standards, the new law reflects the country's plans to join the Basel Convention on control of the movement of dangerous wastes across state borders and their liquidation.

### Czech Power Industry Conducts Energy Poll

*LD1305193191 Prague CTK in English 1730 GMT 13 May 91*

[Text] Prague May 13 (CTK)—57 percent of people in the Czech republic agree with energy production in nuclear power plants while 19.6 percent are against it, according to a public opinion poll carried out in April. The poll was conducted at the request of the Czech power industry enterprise among 1,221 citizens of the Czech Republic, the western region of Czechoslovakia with a population of ten million. The poll showed that 54.5 percent are opposed to energy production in coal-burning power stations and only 23 percent accept it. Some regions of Czechoslovakia are seriously affected by air pollution as a result of energy production in coal-burning plants and coal mining is also causing widespread environmental damage. At the same time, environmental groups draw attention to the risks of energy production in nuclear power stations, especially considering that some of the plants still use the oldest Soviet-made reactors. Regarding continued construction of nuclear power stations, 36 percent agree and 42.5 percent are against it. 3.4 percent think that this construction, even that in progress, should be halted and no new plants should be started. 5.6 percent demand that all nuclear power stations be shut down.

[Przeciszewski] But does this at once point to anything? Do we have at once to be prepared for the worst?

[Kuszynski] We must be prepared for anything, because life abounds in various surprises, dramatic ones too. A year or so ago, when there was a collision with a train carrying chlorine in Bialystok, the matter attracted national interest and immediate protests, and the highest authorities became involved. And yet we face a similar risk in Silesia on a day-to-day basis, but no one mentions this openly. Consider the status of the conveyance of toxic chemicals by road and rail. Do you think that special precautions are being observed, and that that conveyance is being monitored and taking place on specially designated routes? No way. The situation was tellingly summed up by Tadeusz Drozda, who commented on television that Providence is watching over us, but the only question is, until when?

[Przeciszewski] Let us then assume the worst-case scenario. What apocalypse do you envisage?

[Kuszynski] We are aware that a breakdown of equipment at one of the plants I mentioned, in the presence of a wind velocity of two meters per second and a temperature of 15 degrees Celsius would suffice to expose 680,000 people in neighboring areas to direct danger. Computer simulations indicate that 16,000 persons would be affected in the lethal zone and 92,000 in the zone of lighter injuries.

[Przeciszewski] But that is the worst-case scenario.

[Kuszynski] Let me repeat that we must be prepared for anything. But not everyone understands this and at times I am told, even by enterprise managers, too, that my vision is too black and nothing can happen, etc. Such statements are sometimes also made at sessions of the Voivodship National Defense Committee. Were it not for the fact that real life disproves such optimism, I would not object to them....

[Przeciszewski] Real life disproves such optimism? I beg your pardon, but so far I have not heard anything like that. On the contrary, something totally different is being said, namely, that Civil Defense is staring at the hole in the doughnut and looking for money to survive.

[Kuszynski] I recall an instance which took place in a neighboring voivodship, to boot just before a meeting of our own Voivodship Defense Committee. A nitric acid line had broken down and tragedy was close. Fortunately, the resulting cloud moved not over a nearby housing project but in the direction of a forest. A tragedy was avoided, and that was pure luck. Despite everything, some of the managers attending the session of the Voivodship Defense Committee drew no conclusions from that accident and continued to minimize the danger. Why? Not because the Civil Defense is looking for the hole in the doughnut, as you put it, but simply because nobody is willing to add to expenditures, and admittedly civil defense takes money to operate.

[Przeciszewski] Am I to conclude that we are paring costs as far as the Civil Defense Inspectorate is concerned, too?

[Kuszynski] Sure. This year the per capita Civil Defense expenditures in Katowice Voivodship averaged 800 zlotys, whereas one gas mask costs...more than 100 times as much! The situation would be different if we could avail ourselves of the environmental protection fund—for we are taking steps to improve the existing situation—but as usual there are no applicable regulations. Then, too, there is another and no less telling "conservationist" trend, this time at the workplaces. We are concerned because enterprise managers want to limit environmental protection measures to their own plants and labor forces. They are thus interested in workforce warning and alerting systems, safety resources, the training of rescue teams, etc., so long as these are confined to the factory itself, as they think that anything outside the factory fence is within the purview of the administrative authorities. Unfortunately, the fault here again lies with the law, or rather with a gap in environmental protection regulations which merely state tersely that a workplace is obligated to engage in safe manufacturing operations, and nothing more.

[Przeciszewski] How does the Civil Defense react to this?

[Kuszynski] We are not sitting with folded hands. Hence our drive for distributing gas masks. Hence our work on an environmental early warning system. Hence dozens of other measures. Fortunately, Civil Defense is completely apolitical, and the new authorities are perfectly aware of this.

[Przeciszewski] Thank you for the conversation.

### **Delay in Releasing News on Chernobyl Under Investigation**

*LD1505143191 Warsaw TVP Television Network in Polish 1400 GMT 15 May 91*

[Text] The Warsaw Voivodship Prosecutor's Office has commenced investigative proceedings on the delay in releasing the news about the catastrophe in Chernobyl. It aims to establish whether as a result of the delay in making public news about the breakdown, actions intended to counteract the effects of the catastrophe in Chernobyl were delayed.

## **YUGOSLAVIA**

### **Quality of Drinking Water in Slovenia Assessed**

*91WN0368A Ljubljana MLADINA in Slovene 19 Mar 91 pp 22-23*

[Article by Stanislav Kovac: "Filth"]

[Text] On 22 February, the URADNI LIST SFRJ [SFRJ Official Gazette] published the "Regulations on Changes and Additions to the Regulations on the Hygienic Purity

of Drinking Water," signed by Radisa Gacic, the Federal Secretary for Labor, Health, Veterans' Affairs, and Social Policy. With that federal decision, we in Slovenia have returned to the times when yellow signs stood along the Krupa and Lahinja rivers and warned that "fishing was prohibited until further notice." The questionable nature of the new law on drinking water is best illustrated by the words of Stane Brumen, a sanitation inspectorate specialist employed at the Maribor Health Protection Institute: "The absurdity of the new law is best shown through the example of the Krupa. Almost all life was contaminated there, from fish, plants, and poultry to the animals that drank the water. Under the new criteria, water management organizations will be able to let water from the Krupa into the network again, since it satisfies all the sanitary standards and is drinkable." When PCB was discovered in June 1984 in the Krupa's source and the river itself, 250-350 ng/l (nanograms per liter of water) were found; in November 1985, there were record levels of 1,600 ng/l, which means that at that time that source was the most polluted in the world. Since 1929 consumption in industrialized America and Europe has grown continuously, and environmental pollution has grown along with it. "The Americans realized that PCB was extremely dangerous to the environment and to all living things. That is why their legislation on the protection of drinking water says that the permitted amount of PCB is 0 ng/l, and they allow an upper limit of 500 ng per liter of water. In our country we have now introduced an extremely high standard of 500 ng/l, which means that the Krupa, thanks to an administrative measures from the federal institutions, has become pure and drinkable again overnight." Today PCB pollution of the environment is universal; we find it everywhere, especially in industrial and heavily populated countries. The presence of PCB in human and animal organisms is therefore a universal and normal phenomenon. The contamination of people and the environment with PCB, however, has rarely occurred in such a marked and alarming form as the Bela Krajina ecological catastrophe. In human beings, PCB causes the occurrence of diseases, acute or chronic, such as inflammation of the skin and membranes of the eyelids, and damage to the liver, intestines, and nervous system. Eighteen years ago, when the well-known incident and mass poisonings occurred in the city of Yusho in Japan, the well-known American physician John Cabral wrote, "Their action is slow and insidious, and we never know when, where, or how the disease will manifest itself."

PCB pollutes the environment through waste gases and vapors from industrial factories when production is incorrectly handled, and when industrial wastes are dumped into the environment and the waterways, i.e., through the same types of action we are exposed to. Thus, PCB's and wastes from the Semica condensor factory were extremely negligently and irresponsibly handled, and thus caused the major pollution of the environment and rivers in Bela Krajina, so that even today PCB can be deposited in our bodies' fatty tissue

through the water. Can anyone guarantee us that after 2 March, "drinking" water that not only contains the new permitted PCB content, but also many other substances dangerous to our health, such as pesticides, for example, will not be released into the water supply network? In the opinion of Stane Brumen, Slovene rivers and all underground water have suddenly become "clean again." "Since 1987, when the regulations in effect until now went into effect, we have had extremely high standards for pesticides. With the new legislation, however, we have gained very high permissible contents of dangerous biochemical substances. We are back where we were before, but now we are allowing from 500 to 2,000 times greater quantities of toxic substances before the water is banned again. For that whole time, we are exposed to effects dangerous to our health. We know of two groups of dangerous substances. The first group includes, for example, PCB's and PCT's (triphenyls), of which a small dose is characteristic, since they accumulate over time and become dangerous to a person. The second group includes substances like alachlor, aldrin, DDT, endrin, etc., which, according to studies by the International Agency for Cancer Research, have been proven or are suspected of causing cancer in human beings. The occurrence of cancer-related illnesses is influenced by many well-known and less-known factors, and that is why American legislation on carcinogenic substances prescribes a content of 0, whereas here, the maximum permitted quantity is 2,000 ng/l. The standards are so high that in effect there is no danger of their ever being exceeded anywhere in the larger pumping stations." Ecology has thus become one of the weapons in interpublic disputes.

And what is the real state of the surface waters, water sources, and ground water in Slovenia? According to the latest information on the amount and spatial distribution of surface waters which was collected by the Slovene Hydrometeorological Institute, since 1989 the average total consumption of water here was 410 liters/day/person, and we used 210 liters/day/person just for supplying the population. In view of the fact that ground water is more exposed to chemical, biological, radioactive, and thermal pollution, and the fact that polluters more and more often include agriculture, with an increasingly questionable concept of large farms, especially pig farms, we can expect great difficulties with drinking water in the future, taking into account the pollution and its uneven spatial distribution. The spatial distribution of our water bodies is relatively unfavorable, since with low water they decline to about 91 cubic meters/second in the Mura and Drava water basin, but only about 65 cubic meters/second for all the rest of Slovenia. Unfortunately, those two rivers arrive from Austria so polluted that the useful value of that water is seriously reduced. According to the data on water sources that were gathered by Slovenia's registry of waterways and water sources, it is estimated that the capacity of available drinking water from springs is approximately 34 cubic meters/second. Since the ground water is the most important source for the water supply,

we forget that Slovenia's plains with ground water are one of our greatest natural resources, and that the great advantage of the ground water is precisely its accumulation underground

Among other things, Stane Brumen also described the state of the pollution of the Mura and Drava fields. "For all sources of pollution, the Mura field shows the most favorable picture with respect to the chemical parameters of pollution. Here one can observe, above all, an increased content of nitrates, nitrites, and phosphates, which have entered the ground water because of the extensive use of artificial and natural fertilizers in agriculture. In its own way, the Drava field has been the most affected. On one hand, it has the largest amount of drinking water, but on the other hand we have to deal with a large number of filled gravel pits which were used in the past by individual farmers and even entire villages as communal garbage dumps. That is why the biggest problem in the entire Drava field is precisely pollution by pesticides, of which atrazin, metolachlor, alachlor, endrin, prometrin, and simazin are the ones most frequently identified in all the locations sampled. Mercury, nitrates, and mineral oil also appear frequently in the Drava field, in addition to pesticides. Furthermore, the spectrum of organic compounds which are not qualitatively identified is very broad, which indicates pollution of all types. Among the metals, the most frequent are aluminum, copper, boron, zinc, iron, and lead."

In the Ljubljana field, tests of samples of water from the pumping stations which supply the central water supply network of the city of Ljubljana confirmed the pollution of the water because of the presence of agricultural pesticides. Particular attention is also aroused by mineral oils, the quantities present of which, in most cases, were close to the limit values, but in samples of water from the Koteks-Konus DO [expansion not given] well also seriously exceeded those limits. Among the carcinogenic substances present in the Ljubljana field, the main one is fluoranten, but its content likewise did not approach the permitted limit values in any case. In the Hrastje water system, in the old Crnuce well and in the Julon well, experts observed the presence of highly soluble organic substances, and in most cases pollution of the water by sulfates and chlorides could also be observed. With all the above, the results of microbiological studies confirm that the ground water does not meet the requirements that are legally prescribed everywhere, since, for example, samples of water from the Zadobrova station, from the old Crnuce well, and from the Koteks-Tobus DO well did not meet the standards that applied previously. In the event that the new federal law on drinking water also comes into force in Slovenia, it will bode ill for the inhabitants of the city of Ljubljana and the surrounding area. The sources that have been characterized to date as undrinkable will again become irreproachably drinkable

**Table of Permitted Contents of Individual Pesticides and Chemical Substances**

Name	Old Permitted Maximum Content (ng/l)	Increase Factor	New Permitted Maximum Content
PCB	1	500	500
Aklor	1	200	200
Dieldrin	3	33.3	100
Endrin	4	250	1,000
Chlordane	30	66.6	2,000
Enosulfane	1	1,000	1,000
Nickel	1,000	5	5,000

Comment: The increase factor means the rate of the increase in the permitted tolerable content of pesticides and chemical substances

In response to a question about where one should seek solutions for eliminating the causes of pollution, and possibilities for improving drinking water in Slovenia, Emil Zerjal gave us a rather pessimistic answer: "There is still a very prevalent idea among us that municipal wastes do not represent any danger to the environment, and that only particular ones, i.e., industrial wastes, should be dangerous. At present, we have not begun anywhere to institute the European practice of sanitizing trash, except in the immediate vicinity of Austria, where some Austrian enterprises have penetrated. It has to do with the fact that there is still no identification of the source of the pollution anywhere, which is the only solution, judging by European experiences, in spite of all the difficulties. This should be followed by a series of different measures, among which the most important ones are dumps, a system of organizations that could process those wastes appropriately, and flexibility on the part of the state, which will ensure a clean environment for citizens through the tax system. In the case of industrial wastes, we should distinguish among the plants that are producing the most pollutants in Slovenia. Here I am thinking specifically of thermal power plants, steel mills, the Kidricevo TGA [Alumina and Aluminum Works], and the Celje Zinc Works. Another major problem is undiscovered, "illegal" dumps, and the unsettled overall system of future dumps for individual opstinas." With such bleak prospects, appropriate budgetary funds should be allocated on the basis of public opinion, since in the near future we could have such a deteriorated environment that no international financial assistance could help us any longer. Or, as Emil Zerjal says, "The very fact that in one year each Slovene creates an average of 1 cubic meter of trash should be sufficiently alarming."

An assessment of the state of the quality of surface water was provided by graduate engineer Martina Zupan, employed at the Hydrometeorological Institute in Ljubljana. "We observe that there has been a continuation of the slight trend toward a deterioration in quality in the sections of waterways near their sources, with the high content of phosphates measured in the Soca, in the



Trenta, and in the Kamniska Bistrica source standing out above all. I must also emphasize the constant deterioration in the quality of the Medno-Dolsko section of the Sava. The Soca is polluted with lead, zinc, and mercury, and the Idryca with mercury, while the Drava is coming from Austria already polluted with galvanic elements and with lead and zinc. In the Sava, we have observed a general pollution with metals downriver from Kranj, and we also measured a high content in the sources of the Ljubljanica and, which is even worse, in individual samples from the source of the Rizana, which is used for the water supply." Slovene waterways are polluted with organic substances primarily by agriculture and industry. As a consequence of agriculture, biocides have appeared primarily in northwestern Slovenia, the Sava valley, and the Krsko field, and semiaromatic hydrocarbons can be detected in heavily urbanized areas in Ljubljana and Maribor, and in the vicinity of coal mines and thermoelectric power plants—for example, the pollution of the Paka and the Sava below the Sava basin. "The most polluted waterways in Slovenia are the Paka below Krsko, Kamnica Bistrica near Bericevo, Voglajna with Hudinja, Ljubljanica in Zalog, Sora in Medvode, Scavnica in Pristava, the Hubelj near Ajdovscina, and the internal Reka below Ilirska Bistrica," Martina Zupan thinks, adding that periods of drought also have a particularly negative effect upon the quality of the Mura, Drava, Ljubljanica, Sora, and Sava waterways. "Regarding the source of the Rizana, it was

proven by experiments in the years 1985 to 1987 that it was filled from several disappearing streams along the Kozina-Rupa road, along which very large amounts of dangerous materials are transported. It is likewise necessary to warn about the pollution of the Cerknik, Bajejsk, and Bohinje lakes. Finally, we all remember quite well last year's 'blooming' of the Krka river."

Are we in Slovenia threatened by a repetition of the ecological catastrophe that we have already witnessed with the Krupa? Will we have to close several of the most important water sources because of negligent conduct in the past? Or will we even be able to drink water from the network of city water mains? We can seek answers to the questions posed in the ecological tragedy of Slivnik lake, which was described for us by biologist Boris Kolar, employed at the Institute for Health Protection in Maribor: "Because of excessive quantities of endrin in Slivnik lake, the mass death of the fish and all other living things occurred. At the time of the poisoning, the legally allowed level of endrin was 1 ng/l, but the bureaucratic gesture by the federal authorities has increased the permitted maximum content in water to be increased 250-fold. We hope that the competent Slovene institutions, as soon as possible, will adopt our proposed law in drinking water, which is in accordance with West European standards, since otherwise we are threatened not only by an ecological catastrophe, but also an epidemic of broader social dimensions."

## REGIONAL AFFAIRS

**Three Central American Vice Presidents  
Reactivate Trifinio Plan***PA1905182591 San Salvador Canal Doce Television  
in Spanish 0300 GMT 14 May 91*

[Excerpt] The vice presidents of Guatemala, El Salvador, and Honduras agreed on 13 May in San Salvador to reactivate the Trifinio Plan. The three officials also expressed concern over the difficulties they have encountered regarding the Central American Parliament's installation. They agreed that the Trifinio Plan is a feasible alternative for regional integration which would serve as an example of firm and lasting peace.

Salvadoran Vice President Merino announced that the implementation of six elements of the agricultural development plan were agreed upon at the meeting, and they will widely benefit the peasant sector.

[Begin Merino recording] This new phase that we are initiating for the Trifinio Plan obliges us to work alongside the people who are expecting the fruits of development, which will be translated into an improved standard of living for small farmers and into the management and conservation of renewable natural resources and environment, which are in a state of deterioration and in danger of being totally lost. [end recording] [passage omitted]

**Caricom Foreign Ministers Communique Notes  
Environmental Issues***FL1505230891 Bridgetown CANA in English  
1830 GMT 15 May 91*

[Excerpts] Bridgetown, Barbados, May 15, CANA—Following is a partial text of the communique issued here Tuesday night at the end of the 17th meeting of the standing committee of Caribbean Community (Caricom) foreign ministers:

The ministers observed that the meeting of the standing committee was taking place against the background of a continued rapid transformation of the international environment. This transformation is reflected in, among other things, the breakdown of the rigid bipolar system which had been in existence for more than four decades, a global trend toward the formation and strengthening of large economic blocs, and the incorporation of environmental issues as a major element in international relationships. [passage omitted]

**Environment**

In considering the issue of the environment, the ministers of Foreign Affairs emphasised the need on the part of Caricom states for adequate preparation to ensure their effective participation in the United Nations Conference on the Environment and Development [UNCED] which is scheduled to convene in Brazil in 1992.

In this context, ministers expressed the view that the preparatory meetings held in Trinidad and Tobago, Jamaica, and Mexico, as well as the recently concluded meeting of the governing council of UNEP [United Nations Environment Program] in Nairobi, constituted a significant beginning to the process of preparation. The ministers also observed that in advancing such preparations, account must be taken of the following.

—The particular perspectives of the individual member states, especially small island states of the Community; the necessary link between the environment and development; the seminal role of the nongovernmental organisations in this matter; and the possible impact of the north/south differences on the overall need for balanced decisions, treaties, conventions, and agreements on the environment. The ministers agreed on the importance for all member states [of] making arrangements for effective participation in the remaining preparatory process and the UNCED itself.

The ministers also took note of the critical importance of climate change and the Climate Change Convention, and urged the effective participation of the Caricom states in the negotiations for that convention. [passage omitted]

## BERMUDA

**ATBA Status Ignored; Panama, Soviet Union  
Warned***FL1605234891 Bridgetown CANA in English  
2052 GMT 16 May 91*

[Text] Hamilton, Bermuda, May 16, CANA—The Bermuda Government is preparing to fire off a formal protest to Panama over the near-grounding of a Panamanian registered ship on the island's reefs early last week, a spokesman said.

The protest, to be forwarded by Deputy Governor John Kelly, marks the third time this year that the Bermuda Government has complained internationally about near-groundings that could spell disaster ecologically for this tiny British West Atlantic colony.

Last January a protest was sent to Panama over the passing of the Lake Challenger, a 16,775-ton bulk carrier that narrowly missed grounding on reefs off the southwestern end of the island. Late last month, Bermuda protested to the Soviet Union over an incident in which a Russian tanker just missed grounding at North Rock.

In the latest incident, Bermuda Harbour Radio had to have a U.S. Navy P-3 Orion and helicopter buzz the bridge of a Panamanian cargo ship that was on a collision course with the island's northern reefs.

The government spokesman said that the incidents underlined the growing threat to Bermuda from ocean-going ships, despite a programme set up ten years ago to improve island defences against them.

The ROYAL GAZETTE newspaper said it had obtained documents showing that of the more than 100 vessels that pass within 30 miles of the island every month, 'an ongoing core' remained ignorant that Bermuda is an internationally-recognised Area To Be Avoided (ATBA). The newspaper said Harbour Radio reports also concluded that many shipmasters ignored the ATBA; ignored the advice of its on-duty officers to avoid the ATBA—possibly because of language problems; failed to respond when called; and failed to set proper lookouts in Bermuda territorial waters.

Marine and port documents, the GAZETTE said, also showed the persistence of danger. In 1990, no radio contact was made with five vessels that entered the ATBA, while seven entering the area were on a potentially dangerous course. In 1989, 12 ships passed through the ATBA without radio contact being made, while two entering the area were considered to be on a potentially dangerous course.

## BRAZIL

### Environment Institute Warns of Overfishing Amazon River

PY2405184391 Rio de Janeiro Rede Globo Television in Portuguese 2300 GMT 20 May 91

[Text] The IBAMA [Brazilian Institute for Environmental Affairs and Renewable Natural Resources] has issued a warning; The Amazon River could become depleted of fish. Tonnes of fish are being wasted every day because of out-of-season fishing and because of lack of cold storage facilities. One third of the entire catch is thrown away.

Fishing with a rod is a waste of time in the Amazon River today. The most serious shortage in the largest river in the world—volume-wise—is fish to swallow the bait. The use of nets is the only way to get something, but there lies the main problem: The mesh used is 20 times smaller than that permitted by the IBAMA.

There are approximately 2,000 known species of fish in the Amazon basin. Adult examples of the main species, tucunare, (baquipe), and (Arucu) can weigh up to 150 kg. Today, however, only young fish are found in the fine-mesh nets. Most of them do not weigh more than 1 kg and they are caught long before reproductive age. According to IBAMA, this practice endangers the future of fishing in the entire Amazon basin.

Nearly 500 tonnes of fish are caught every day and this catch is not checked when weighed. Another problem is the lack of cold storage facilities to preserve the catch. In the small fishing boats the ice melts quickly. The fish that is not sold during the day is lost. A third of all that is caught per year in the Amazon basin is thrown away: 60,000 tonnes. This is enough to prepare a banquet for the entire Brazilian population.

[Begin recording] [Unidentified fisherman] Part of the catch is not good for sale or for eating. We sell it at Black River. People out there want it.

[IBAMA Superintendent Jose Amauri] The population of Amazonas State eats mainly fish. Consequently, when fish stocks become depleted we might have to fish other regions, perhaps even in other countries. [end recording]

## GUATEMALA

### Problems, Causes of Deforestation Studied

91WN0445A Guatemala City SIGLO VEINTIUNO in Spanish 22 Apr 91 p 12

[Article by Claudio Cabrera Gaillard]

[Excerpts] Guatemala was called a "land of trees." The word "Guatemala" comes from the word "Quauhtemalan," which means "land of trees" in the Nahuatl, or Nahuatl language. According to some researchers, "Quauhtemalan" was a translation of the word "quiche" (qui—many; che—trees) which the indigenous Nahuatl people, who came from what is now Mexico, used when they accompanied Pedro de Alvarado.

More than 60 percent of the soil in Guatemala is suited to forest use. That is, the characteristics of the soils—particularly their pitch and depth—are particularly adapted to sustained forest production and/or protection of the soil over the long term. However, it is not enough for ground to be well suited to forests to have forest development. The realities of the forestry sector provide evidence of this.

In 1989 less than 40 percent of the surface of the country was covered with natural forests, which were of four kinds:

- (a) Broad leaf forests, commonly called jungles, are forests characteristic of areas at low altitude (the Departments of Izabal, Peten, the northern part of Alta Verapaz, Quiche, and Huehuetenango). They are composed of species of trees with broad leaves. These forests account for 76 percent of the forested area of the country.
- (b) Coniferous forests. These are made up of forests of mixed, cone bearing species, including fir, cypress, and several species of pines. The coniferous forests cover approximately 15 percent of the forested area of the country.
- (c) Mixed forests. These are made up of forests of coniferous and broad leaf varieties, basically including pine and oak trees. These forests cover 7 percent of the forested area of the country.
- (d) Mangrove forests. These are made up of broad leaf species with the special characteristic of establishing themselves in coastal areas in a dynamic relationship with clean water. Mangrove forests occupy about 16,000 hectares, which amounts to 0.4 percent of the forested area of the country.

Other, less representative types of forest are found in the country, such as cloudy forest (in the Sierra de las Minas and at upper levels of some volcanoes) and dry forest (in certain areas of the South and southwestern part of the country).

This variety of ecosystems shows that the country has woods like or similar to those of temperate and tropical forests. For example, there are other forest products which are even exported, such as latex (chicle), resins, xate, pepper, etc.

In 1988 the forestry sector recorded a deficit in the merchandise trade balance of more than \$50 million.

How is it possible that a country so well suited to forests, with enough ecological diversity for the potential production of a large variety of forest products and services, could run up a deficit in the trade in such products?

It may be that the deficit in this sector has declined over the past few years, due to the increase in exports of forestry products in 1989, which amounted to \$16 million.

Nevertheless, the forest industrial sector does not take into account the volume of raw materials necessary for it to function. This is essential data for national and regional planning in the forestry sector. [passage omitted]

In Guatemala deforestation to change land use amounts to about 50,000 hectares per year. (One Hectare is a surface measurement equal to 10,000 square meters.) That amounts to 1,100 caballerias [1 caballeria equals 42.79 hectares] per year, or an area equal to the land area of the entire Department of Sacatepequez. It should be noted that 76 percent—if not more—of the total area deforested annually is located in the Department of El Peten, amounting to 38,000 hectares (844 caballerias per year).

Reforestation at the national level—if we take an optimistic view of it—amounts to about 2,500 hectares per year, which implies an annual reduction in forest cover of 47,500 hectares per year.

#### Who Is Deforesting the Country?

Deforestation has four principal causes at the national level:

- (a) Deforestation for agricultural activities.
- (b) Deforestation for the production of firewood.
- (c) Deforestation to produce lumber for the timber industry.
- (d) Deforestation for urban growth.

Deforestation for agricultural purposes is the principal, national cause of cutting down trees. This activity consumes about 6.5 million cubic meters of timber annually, which are burned as an operating practice of agricultural activity. The majority of this deforestation takes place, as has already been pointed out, in the department of El

Peten. It is the result of spontaneous and planned colonization<sup>1</sup> of state owned forest land, essentially by landless farmers coming from central, western, and eastern high plateau of the country. The rate of population growth in the Department of El Peten is 5.35 percent annually, more than 30 percent of which is due to migration, since the national medium population growth rate is 2.9 percent.

According to the Secretariat General of the Council of Economic Planning, the estimated population of the department of El Peten in 1990 was 240,300. This implies a population growth of 12,015 per year, of whom 3,124 immigrated into the department as adults. The land needs of the population resulting from natural (automatic) growth develop over the medium term (15 to 20 years). On the other hand adult farmers immigrating into the department have an immediate need for land.

It can be concluded that the Department of El Peten has been an escape valve for the country's agrarian problems. However, state owned forests have paid the price, since there has been no control over resettlement on state owned lands. An hypothesis may be advanced that there has never been a critical lack of agricultural land over the past 20 years because of the possibility which the department of El Peten always offered for accepting landless farmers. This program of resettlement was applied in a small area of land and was both spontaneous and unplanned for the most part.

It is estimated that the national consumption of firewood amounts to 13 million cubic meters, or more than the volume of wood consumed as a result of changes in land use. However, quantifying this use in terms of the area involved is difficult since, in most cases, it involves the selective extraction of trees without cutting down a whole forest or burning it. Firewood is also produced in what remains of deforested lands and forest production areas, in green strips, and in other areas. It has become a matter of national importance to have a strategy to supply these requirements, since approximately 78 percent of all Guatemalan homes use firewood as a fuel. According to the Ministry of Energy and Mines, firewood covers 65 percent of national energy needs.

Forest industry consumes less wood than may appear to be the case. It is estimated that, including the illegal extraction of wood, the forestry industry consumes between 1.0 and 1.5 million cubic meters of wood. This implies that forest industry consumes about seven percent of the total, national consumption of wood. It is clear that in certain areas of the country the extraction of wood from the forests has not changed the use of land but rather has opened the way for the entry of agricultural resettlement. Roads and gaps in the forest have been the only means of access for landless farmers to clear and take over land.

On the other hand traditional ways of forest exploitation (not employing the techniques of tree farming and still less forest management) are also called periodic use of



the forest. In this case the person exploiting the forest does not commit himself to the reproduction of wood, the raw material involved. This practice has two characteristics: a lack of responsibility on the part of the person exploiting the forest areas and significant, short term economic benefits.

According to Flohr<sup>2</sup> in 1981, 65 square kilometers of forest disappeared in the metropolitan areas of the country between 1971 and 1981, due to urban growth. This is equivalent to annual deforestation of 813 hectares per year. Despite the fact that this represents only 1.6 percent of the area deforested for agricultural and livestock use, it is no less significant. It is estimated that during the 1990's the pace of deforestation in urban areas has increased significantly.

#### Deforestation: an Environmental or Survival Problem?

Several problems are caused by cutting down trees: the disappearance of commercially valuable forests, the loss of existing genetic material (That is, vegetable genetic material. Even if no particular use is known for it, it has potential usefulness in pharmacological, textile, and wood industry, for medicines, food, and woodworking purposes), micro and macroclimatic changes, changes in biogeochemical cycles, and interruptions in the hydrological cycle, among other things.

The use of land in accordance with its capabilities is a well established, technical tool. However, it has almost no application in countries like Guatemala. For example, with the exception of the valleys, the soils of the central and western high plateau of the country are best suited for forests. How could a forestry extension specialist recommend to a farmer in this area to plant 5,000 small trees on his two-hectare parcel of land and then wait 40 years to harvest it? These soils are best used for forest. However, agrarian realities prevent these soils from being used as they should be. The problem of deforestation and reforestation is a problem of survival [passage omitted].

The farmer understands very well the goods and services that the forest generates. Even many indigenous communities have kept up the forests for their communal organizations and their vision of the future, in which they believe that mankind is part of the cosmos. As long as the "free market" economy does not place any particular value on mankind and the natural resources of the country, and other opportunities to provide jobs for landless farmers are not made use of, the state owned forests and Guatemalan society will pay the bill.

#### Footnotes

1. Reforestation: the occupation of forest areas to carry on agricultural production, regularly changing the original characteristics of the ecosystem, from trees to cultivated plants.

2. C. Flohr, "Analysis on the Deforestation of Guatemala City and Its Area of Influence Over the Period

1954-1981." Agricultural Engineering Thesis, Faculty of Agronomy, University of San Carlos, 1981. 31 pp.

#### Deforestation, Contamination by Celgusa Factory

91W 50445B Guatemala City SIGLO VEINTI UNO (ECOSISTEMA SUPLEMENTO) in Spanish 22 Apr 91 p 12

[Excerpts] The following article is the summary of a thesis by Dr. Marcia Alejandra Sobenes Garcia, of the Faculty of Juridical and Social Sciences of the University of Rafael Landivar. [passage omitted]

Today the problems of environmental contamination due to unused industrial effluents have become clear. An example of this is occurring here in Guatemala in the case of contamination of Lake Amatitlan, the case of Celgusa [Cellulose Industries of Guatemala, Inc.] Chixoy, etc. The Celgusa case is worthy of study, for it is a typical example of the environmental problems caused by industry.

Celgusa, S. A., was established in 1977 to exploit the forests, to carry out reforestation, to perform specialized forest services, to produce forest products, cellulose, paste, and related products, and to do other things. In 1985 the value of the investment was calculated at \$200 million. It includes a plant built on the banks of the Rio Montagua.

The area chosen for the Celgusa project includes the region located northeast of Guatemala City. It fans out over a radius of 150 km from the plant and covers the departments of El Progreso, Zacapa, Chiquimula, Alta Verapaz, Baja Verapaz, and Isabal.

For approximately the past six years timber has been cut on a massive scale, both for local sale as well as for export. The problem is that the areas cut down have not been reforested. A matter worth mentioning is the fact that, despite the fact that Celgusa has existed since 1977, it was registered with the former Interior [National Forestry Service] as a forest industry until 1982 and as a sawmill in 1984. This shows a lack of control over industry in our country or, what is more serious, existing administrative corruption.

Initially, Celgusa offered to manage 18,000 hectares of natural forest and stated that it would reforest 20,000 hectares of land. In this large deforested area are several rivers, which have been drying up as a consequence of deforestation, a matter which was originally reported to the government but which took no action on it.

Celgusa is also involved in the production of cellulous pulp for paper, based on wood chips from young pine trees. This process creates consequences which disturb the environment, such as hydric and gaseous contamination through the use of chemicals such as caustic soda and sulfates used for bleaching the pulp.

The company built a plant for this purpose on the Rio Montagua to use its waters. The company made the

following statement: "The water used for washing and bleaching purposes will contain the following substances: acid residues, alkaline residues, lignites, and derivatives of other organic materials, both soluble and insoluble. For treatment purposes the plant has installations capable of neutralizing and separating these components before they are discharged into the river."

This is a disturbing matter which shows how industry can produce so much contamination and cause ecological change, with a consequent deterioration in our natural resources. At the same time it provides evidence of the limited or complete lack of government control over the harmful effects of this plant. [passage omitted]

## HONDURAS

### Desertification Continues Unabated in Siguatepeque

91W'N0425A Tegucigalpa LA TRIBUNA in Spanish  
6 Apr 91 p 50

[Text] With more than 50,000 inhabitants, it was known as the "City of Pines" for its extensive forests, but today it is facing the greatest crisis in its history as a result of the serious deterioration not only of its forest resources, but of its water, animal, climate and soil resources as well.

In attempting to find a basic solution to the destruction of the forests, Deputy Guillermo Martinez Suazo organized a symposium with the participation of the National Congress's Commission on Natural Resources, comprised of Guillermo Sevilla, Juan de la Cruz Avelar and Rafael Pineda Ponce; Cohdefor [Honduran Institute for Forestry Development] General Director Porfirio Lobo; and members of the Armed Forces led by Colonel Manuel de Jesus Banegas.

Engineer Rene Recarte led a discussion on Siguatepeque's deforestation with the various institutions represented there, noting that the destruction has reached genuinely alarming levels, since a large part of those resources are lost annually to fires, as well as to the following: 1. Secondary industries (posts, fencing) 3,250 meters, 30 hectares; 2. Migratory agriculture, 25,000 meters, 500 hectares; 3. Forest fires, 7,500 meters, 250 hectares; 4. Extensive grazing, indirect damages; 5. Firewood cutting, 150,000 meters, equivalent to 2,000 hectares; and 6. Growth in residential areas, 2,500 meters, 50 hectares.

### Total Firewood Consumption

Total domestic consumption 80,000 meters, urban consumption 37,000 meters, rural consumption 43,000 meters, industrial consumption 70,000 meters, lime kilns 34,000 meters, tile and brick kilns 29,000 meters, pottery kilns 3,000 meters, bakeries 2,000 meters, mills 2,000 meters.

Given this rate of deforestation and the total area of forests currently remaining, 8,000 hectares, it is estimated that the Siguatepeque forests will be totally inadequate in four years if viable measures are not immediately taken, which only require the political will and the participation of the entire community.

Given the origins of the problem, it is important at this time to define the strategies and actions to be taken, which can be classified as socioeconomic, cultural, technical-institutional and legislative-judicial.

Presenter Rene Recarte concluded with the following recommendations:

1. Create a technical-judicial-interinstitutional organization that will be charged with planning, coordinating and executing all activities involving the conservation and protection of natural resources in Siguatepeque.
2. Establish an arbitration plan to regulate agricultural grazing and forestry activities in coordination with the operating plan for the protected forest zone, as defined by SANAA [National Water and Sewage Service].
3. Manage the economic assistance from international organizations promoting the conservation of natural resources for the activities of the technical-judicial organizations.
4. Promote forestry research projects involving environmental conservation, with technical, financial and international support.

At the symposium, it was established that what has been lacking is coordination of the institutions involved in forest protection and reforestation.

Colonel Jesus Banegas, representing the Chief of the Armed Forces, said that "although everyone says that it is necessary to execute the dispositions, we created the green battalions and then were abandoned. I have a battalion in Yamales that hopes to plant a million seedlings this year, but we have only been able to plant 10,000 because we were abandoned, the officials from the institutions involved in these activities never appeared."

INA [National Agrarian Institute] inspector Alfredo Landaverde said that it is first necessary to train the inspectors, and that doing so will cost 4,000,000 lempiras.

He also said that in this type of meeting the rancheros and various peasant organizations should be present to make them aware of the magnitude of the problem, "because there is no more time, we are at the point of becoming a desert."

## REGIONAL AFFAIRS

**'Toxic' Gases Darken Skies of Iran's Fars Province***LD1905125791 Tehran IRIB Television First Program Network in Persian 1215 GMT 19 May 91*

[Text] According to the Central News Unit, nearly 570,000 tonnes of various gases that cause pollution arrive daily over the skies of Fars Province from the southern Persian Gulf. Due to the atmospheric imbalance caused, many difficulties have arisen for the residents of Fars Province, especially in the large city of Shiraz.

According to the director of the Fars Province Office of Environmental Protection, during Ordibehesht [Iranian month starting 21 April] of every year, the skies over Shiraz are at their best. But, this year, due to the burning oil wells in Kuwait, there are no signs of the clear blue skies over Shiraz. In fact, the entry of over 500,000 tonnes of toxic and contaminating gases together with large amounts of unburned hydrocarbons, which are drifting from the south to the center of Iran, have blackened the skies over Shiraz. They have made breathing difficult.

**Iranian Official on Environmental Effects of Gulf Pollution***91WN0386A Tehran ABRAR in Persian 18 Mar 91 p 10*

[Text] Time, specialized skills, and sufficient resources will be needed to study the extent of destruction and to develop an awareness of the effects of oil pollution in the Persian Gulf in view of the thickness and extent of the oil spills at the surface of the water, the depth of the water, the variety of animal life and aquatic plants at the surface, the depth and bottom of the sea and finally the extent of resistance by each of these to this pollution.

Engineer Mahram Nezhad, deputy director of research at the Environmental Protection Organization, gave an interview to a correspondent from the ISLAMIC REPUBLIC NEWS AGENCY. As he announced the above, he added: Another important issue in these studies is the long-term effects of various petroleum substances on each of the varieties of animal and aquatic plant life and finally upon their food chain. He said: It is clear that oil pollution has damaged the sea and is having undesirable effects on aquatic life and marine birds.

He said: Crude oil contains every refined petroleum product from gas to tar. In the first moments the gas in the crude oil rises, and the remainder, depending on its weight, sinks to the bottom or floats in suspension in the water. Engineer Mahram Nezhad said: In the course of time floating oil takes on various states and is changed into huge slicks unless broken up by ocean storms.

He said: Huge surface water oil slicks can be collected with existing resources, but there is no way to deal with

the heavy oil which has settled to the depths of the Persian Gulf, working its destructive effects on the bottom and on bottom-dwelling plant and animal life. The deputy director of research at the Environmental Protection Organization discussed ways of collecting oil slicks. He said: These slicks can be restricted and made more fluid by thick plastic walls (booms), and finally drawn from the surface of the water by a sucker (skimmer).

He said: If the slick is thin, it cannot be recovered with this method. For this purpose petroleum-eating bacteria are used, which have been produced in huge quantities in the industrial nations.

The deputy director of research at the Environmental Protection Organization discussed the direction of movement of this pollution and the effects it could have on the coasts of Iran. He said: The prevailing wind in the Persian Gulf is from northwest to southeast, and this will prevent the pollution from reaching the shores of Iran, but the water currents flow from northwest to southwest and turns into a whirlpool in the vicinity of Qatar. On the other hand, the size of this whirlpool's radiation depends on the wind. If the radiation from the whirlpool is small, the oil pollution will go back to Saudi Arabia and Bahrain, but if the radiation from the whirlpool created by the ocean currents (the Gulf Stream) is large, it will reach the ports of Dair and Kangan in the waters of the coasts of Iran. He said: During the imposed war and setting fire to the Nowruz oil well, the same ocean currents took the pollution to Saudi Arabia and the south of the Persian Gulf.

Engineer Mahram Nezhad also said: Based on a measure taken by the Kuwait Convention (composed of eight Persian Gulf nations) all nations in this region were required to study the extent of pollution on their coastlines. This was not possible in our country because of the continuing imposed war.

He added: Immediately after the ceasefire was accepted, an 18-month study began to look into the ecosystem of the waters of the Persian Gulf and the Sea of Oman along the coasts of Iran to the end of its territorial waters from Bandar Gonaveh to the Straits of Hormoz, and it is still continuing. He added: In these studies we noticed the oil pollution and the extent of its damage in some places, and we are now preparing a map of the polluted areas and the extent of the damage. This will be a good beginning to study the extent of pollution in the future. Engineer Mahram Nezhad discussed the activities of the Persian Gulf Pollution Crisis Staff, which was formed by the order of Mr. Hashemi Rafsanjani in the presence of fully-authorized representatives of eleven ministries and organizations. He said: This staff has begun its work by forming two committees for "observation" and "confrontation".

He added: The observation committee, which was formed from the Fisheries Organization, the Continental Shelf Oil Organization, the Army Naval Force, the

Reconstruction Crusade and the Satellite Center, in view of the essence of their work and the connection they have with the Persian Gulf, make daily reports to the confrontation committee on all incidents observed or of which they in some way have knowledge.

Engineer Mahram Nezhad said: Based on reports received from the observation committee, oil pollution caused by the Persian Gulf war as of yesterday morning (Sunday 25 Esfand [16 March 1991]) is floating off the coasts of Saudi Arabia and Kuwait. He said: After a month this pollution usually turns into tar balls, and there is no way to recover or prevent this type of pollution, and even worse, it is quite dangerous.

Engineer Mahram Nezhad added: Tar balls are sticky, like balls of dough, and in time they will stick to the hulls of ships, docks and coasts, and damage them.

He also said: The oil slicks caused by the Persian Gulf war seen near the coast of Qatar are currently far away from the shores of this nation, and it is not clear to us now whether or not the oil spills in the Persian Gulf have been stopped or are continuing.

The deputy director of research at the Environmental Protection Organization discussed the responsibility of the confrontation committee of the Persian Gulf Pollution Crisis Staff. He said: Based on the duties assigned to it, this committee has identified, assembled and coordinated the resources in all the nation's relevant organizations to prevent the incursion of oil slicks.

He said: Another reality is that it is beyond the capability of one country alone to confront the oil pollution on the shores of the nations in the region. All nations in the region and even outside the region must participate in this cleanup.

He discussed the air pollution caused by setting fire to Kuwait's oil wells. He said: These fires are creating thick smoke which is being blown by the wind to the skies of other nations in the region.

He said: This smoke, in addition to the highly toxic substances being carried into the soil from it by rainfall, is blocking the sunlight, darkening the skies and lowering the temperature.

#### **Oil Pollution at the Port of Dailam Spreads**

Oil pollution in the Persian Gulf caused by setting fire to Kuwait's oil wells has spread and now reached the shores of the Port of Dailam.

According to the ISLAMIC REPUBLIC NEWS AGENCY, this pollution has appeared on the surface of the water in the form of red and green oil slicks, and has been readily visible in this port since Thursday. According to gendarmerie officials stationed in the area, this pollution is so heavy that it could easily catch fire.

This report states that the air in the region is still polluted. Black rainfall in the last few nights in the cities

of Gonaveh, Bushehr and other parts of the province shows the extent of this pollution.

#### **Kuwait Pollution Damaging Iranian Crops**

*LD2305195691 Tehran Television First Program Network in Persian 1215 GMT 22 May 91*

[Text] Pollution caused by the burning oil wells of Kuwait has had damaging effects on the agricultural products of Bushehr Province and has created difficulties for farmers. An official of the Bushehr rural cooperation organization referred to the fact that the damage caused to wheat cultivated by dry-farming has been worse than other products. He added: As a consequence of this pollution, 40 percent of the produce of the region's farmers has been affected by the pollution and suffered damage.

#### **Destructive Effects of Black Rain in Iran Outlined**

*91WN0427A Tehran ABRAR in Persian 3 Apr 91 p 9*

[Text] Black rain in Khuzestan Province has high percentages of lead and sulphate.

The World Health Organization revealed Thursday that analysis of rain water samples in two areas of the Province of Khuzestan in Iran adjacent to the burning oil wells in Kuwait indicates that the water is undrinkable.

According to the FRENCH NEWS AGENCY in Geneva, the analysis of the water samples at two specialized laboratories in Geneva by Dr. Hirushi Nakajima, the director general of WHO, shows that the black polluted water has high percentages of lead, sulphate and other organic substances. High levels of lead pollute these waters six times the level deemed acceptable by WHO for children and infants. According to this report, the sediment level is 12.22 grams per liter, with an organic ratio of 13 percent.

The level of organic particles in the water is 1.6 grams per liter, which is much higher than that of the worst conditions existing naturally.

WHO is mostly worried that the organic particles may be the result of the incomplete burning of oil, in which case, the water could contain several carcinogens. Samples of the soil by Dr. Nakajima also show that the soil is highly polluted with heavy metals such as lead and cadmium as well as hydrocarbons.

The WHO report indicates that the long-term pollution and accumulation of heavy metals in the soil can prove hazardous to health because the level of accumulation will be poisonous.

#### **A Patch of Black Cloud Observed in the South of Gachsaran**

A large mass of thick smoke covered the sky Thursday morning in the city of Gachsaran.



According to IRNA, the black mass is the result of the burning of the oil wells in Kuwait and is slowly moving towards the northeastern parts of Gachsaran. The blackness of the walls of buildings and the surface of streets in the city of Dogonbadan is evidence of the brief black rain on Thursday. Since the oil and natural gas wells of Kuwait were set ablaze, black rain has twice poured on the city of Gachsaran.

The head of the environmental office of Gachsaran in contact with the reporter for IRNA, referring to the fact that the activities of the wells and oil and natural gas installations of that city also pollute the air, added: The masses of black smoke and its high density resulting from the burning of the oil wells in Kuwait carry the danger of acid rains.

He added: The continuation of air pollution and acid rain will severely affect agricultural products, pastures, forests and the river waters.

## ALGERIA

### Study Estimates Water Resources in Southern Desert

91W'N0391A Algiers AL-SHA'B in Arabic 30 Mar 91  
pp 1, 3

[Article: "Water Resources in the Desert: Serious Shortfall in Distribution Expected by 2010"]

[Text] Underground water resources in southern Algeria are estimated at 60,000 billion cubic meters and are especially plentiful in the lower-most aquifer and the aquifer draining into it, since these two layers contain important reserves that are only weakly renewed.

Within the framework of the studies that are done on water resources in the northern desert, a mathematical model was prepared on the exploitation of these two water layers. It came to various conclusions on exploiting these regions; thus four regions were subject to renovation.

The first region, consisting of el-Menia, el-Guerara, Touat, and I-n-salah has great potential; the region of Ghardaia, Metilili, Berriane, and Zelfana has medium potential; the region of Oued Rhiou has weak water resources; and finally there is the region of limited potential.

For the record, water resources were previously exploited according to existing potential in the regions between Oued Rhiou and the Saharan Atlas.

On the other hand, the population of the wilayas of Biskra, el-Ouad, Ouargla, Ghardaia, and Adrar will see a rise from 1.3 million in the 1987 census to 3.4 million in 2010. Accordingly, the need for drinking water and industrial water for the year 2010 is estimated to be 220 million cubic meters. Moreover, available water resources allocated to irrigation are estimated to be at

least 1930 cubic meters per hour a year, 522 of which are for Biskra and el-Ouad, 994 for Ouargla, 179 for Ghardaia, and 235 for Adrar and I-n-Salah.

The main goal is embodied in improving the process of supplying the areas now irrigated with water by raising the flow of water from 0.4 and 0.1 liters per second per hectare to 0.70 liters per second per hectare on the one hand, and expanding the irrigated land by achieving a special, similar rate on the other.

The analysis of the threat of the shortfall which could occur in the future with respect to the regions of Biskra and el-Ouad, and of the water needed to improve the process of supplying it, was derived from assumptions concerning the irrigated area which is expected to expand by the year 2010 from 41,100 hectares to about 150,000 hectares, while the water flow will change from 105 cubic meters per second to 3.3 billion cubic meters a year.

This expansion will allot 68,000 hectares to the region of Ouargla and Hassi Messaoud; 22,000 hectares to Adrar; 12,000 hectares to Ghardaia; 4,500 hectares to el-Ouad, and 4,000 hectares in I-n-Salah, or a total of 110,500 hectares. The acreages that will be irrigated by other water resources are estimated at 7,900 hectares in the year 2010. This change will also allot 3,500 hectares to the region of Bechar, about 3,000 of which are for the region of Abadla; 2,000 hectares to Biskra; 200 hectares to Illizi; 1,000 hectares to Tamanrasset, and finally 200 hectares to Tindouf.

However, long-range expectations concerning the exploitation of water resources uncover shortcomings that will be difficult to eliminate without resorting to changes that would add to the previous investments, even if they see a rise because of the costs of drilling and digging operations.

On the other hand, even if there should be an assessment of the other water resources, and even if it is done quickly for the two wilayas of Biskra and el-Ouad, it seems that it will be necessary to cut back the goals of the law of obtaining farm real estate.

In addition to the threat of this shortfall which water resources will see in the long term, there is the threat that it will be impossible to drain the water as a result of the elevation of the low lands of the Chott or the land adjacent to it within the framework of the law governing the acquisition of farm real estate.

The Ministry of Equipment has carried out some immediate operations in addition to preparing a plan to assess and protect water resources in the desert regions, bearing in mind that these operations singled out the region of Rhiou within the framework of producing studies to review and expand the cultivation of dates in this region.

It should be mentioned that the national agency for water for irrigation and drainage facilities will prepare its

program starting this year to plug up the damaged wells that were dug with the aim of protecting water resources.

Regarding the regions of Touat and Guerara, the on-going studies of renovation and expansion will be put into effect as soon as the on-going cartographic studies are finished. On the other hand, studies will be done on plans to assess water resources in the desert regions.

## INDIA

### World Bank To Probe Allegations About Indian Dam Project

OW2605132791 Tokyo KYODO in English 1217 GMT 26 May 91

[Text] Tokyo, May 26 KYODO—The World Bank plans to ask an independent mission to investigate allegations a massive dam project it is cofunding in India violates its rules on resettling displaced people and environmental protection, environmentalists said Sunday.

Environmentalist attorney Lorie Udall, citing World Bank sources, said the mission is to be dispatched in September to examine complaints the Indian Government lacks adequate resettlement plans for 90,000 of the more than 100,000 people who will be dislocated by the project.

The Sardar Sarovar Dam in central-western India, which got underway in 1985, is also being built without an environmental assessment required by the World Bank before a project can be approved, said Udall, who is with the Washington-based Environmental Defense Fund.

The World Bank is expected to announce the mission, led by former Director of the United Nations Development Program Radford Morse, later this week, Udall said at an international symposium in Tokyo on the project. It will be the first time the World Bank sends a mission made up of investigators not on its staff.

The 5.9 billion dollar project to construct a dam for power, irrigation and drainage was launched with a 450 million dollar loan from the World Bank supplemented by an 18 million dollar loan from the Japanese Government.

Japan suspended funding a year ago, citing insufficient provisions for relocation and environmental concerns.

The 10-year project along the Narmada River would submerge 25,000 hectares of forests and farmland in three drought-prone states in western and central India, Gujarat, Maharashtra and Madhya Pradesh.

The project also has been plagued by funding shortfalls and stiff local opposition marked by protests by thousands of people who may lose their homes.

Smitu Kothari, a spokesperson of the Save Narmada Movement in New Delhi, warned that confrontations between police and local people are likely to intensify in

the coming months because the monsoons will cause the dammed river to rise upstream, pushing about 5,000 people from their homes.

Neither the residents, whose livelihoods are on the line, nor the local politicians, who regard the project as a prestige symbol and a test case for other dam projects, are likely to give in, said Kothari.

The dam is part of a larger Narmada Valley Development project that envisages constructing 30 major dams and 3,000 smaller ones over 50 years.

Kothari said fund-raising difficulties have forced the government to divert funds from education, rural electrification, and other social projects for the dam.

Officials from the symposium organizer, Friends of the Earth Japan, said the World Bank declined to send a representative to address the symposium, despite its stated policy of increasing dialogue with nongovernment groups.

The Indian Government canceled its participation because its representative was unable to attend due to personal reasons, organizers said.

## JORDAN

### Minister Assesses Storm Damage, Water Shortage

91WN0418A Amman THE STAR in English 4 Apr 91 p 4

[Text] The devastating storms which hit the southern parts of the Kingdom last week, have focused national attention once more on the water issue, in Jordan. So far, Ministry of Water and Irrigation figures put the amount of damage to water and irrigation installations in the southern region roughly at 1.56 million JD. These figures do not include damages to the infrastructure such as roads, bridges and agricultural areas.

In spite of the unprecedented amounts of rain that have fallen on Jordan, especially its southern parts, during the last few weeks, the water situation in Jordan remains critical according to Water and Irrigation Minister Mr. Sa'ad Hayil al-Surur. In an interview with THE STAR Mr. al-Surur said that his ministry is studying a number of options to deal with a possible water shortage during the long and hot summer months this year. Of these options, the ministry, with the various authorities attached to it, is considering water rationing and distribution schemes in an attempt to control the consumption of drinking and irrigation water.

The Jordan Valley Authority (JVA), Mr. al-Surur said is also studying the possibility of adjusting the crop farming norms in the Valley during the summer so as to control, or even eliminate, vegetable farming and allocate irrigation water to citrus and other trees.

Mr. al-Surur said that damage to water systems a result of floods was confined to three governorates, namely Karak, Tafilah and Ma'an. Mostly hit, was the sewage and water network in Tafilah. While distribution of water was halted for few days, Mr. al-Surur confirmed that by last Tuesday, nearly all Water Authority services were restored in the three governorates, although some services were restored on temporary basis. The sewage network in Tafilah was destroyed in some parts, and though most of the network is now functioning, the rebuilding of a six-kilometer-long network, by local contractors along with Water Authority cadres, will require at least one month.

On the other hand, while most of JVA's irrigation projects in the southern Ghors suffered minor damage, destruction in irrigation projects in Wadi Karak, Wadi Ibn-Hamad, Wadi al-Hasa and Wadi Khinzirah was major. Still Minister al-Surur confirms that he stands by his promise to local farmers to make all of these projects operational by Tuesday. "Our main concern is to deliver irrigation water to farmers even on temporary basis," he said. JVA's engineers have come up with practical solutions to almost all problems. Cement aqueducts which have been swept away by flood water were replaced with sand barriers, whose floor is covered with plastic.

As to cement barriers and reservoirs, which were filled with debris and rocks by floods, they became operational as soon as they were cleaned and repaired.

Minister al-Surur expressed his appreciation of the visit of His Royal Highness Crown Prince Hassan to the distressed regions, and of the efforts exerted by the JVA and Water Authority workers, in dealing with the damage. "We are keen on learning from this recent experience," said Mr. al-Surur. "Talk within the ministry now focuses on the need to build dams in the south of the country." Apart from few sand barriers and water reservoirs, there are no major dams in the south of the Kingdom. "We have been studying the possibility of building up dams in the south before the floods, ever since the Prime Minister directed us towards building more sand barriers in the desert to collect water," the minister said.

But the ministry is waiting for its budget for this year to be approved since construction of these proposed dams will require the purchasing of special equipment. Dams will vary in form and function in accordance with the geography of the area and the amount of annual rainfall expected. Most eligible areas or future sand dams are Wadi al-Hasa and Wadi al-Mawjib.

Mr. al-Surur does not believe that the answer lies in constructing large, and expensive dams. He rather believes that the most suitable policy now, is to construct as many small sand barriers along Jordan's southern flood areas, as possible.

The minister revealed that the amount of water in Jordan's large dams is still below safe margins. Before the rainy season started, King Talal Dam had no more

than 6 million cubic meters, while its capacity is estimated at 80 million cubic meters. "At any given time there should not be less than 20 million cubic meters of water," said Mr. al-Surur. Today the same dam contains no more than 27 million cubic meter, which is much less than Jordan's summer irrigation needs, in the Jordan Valley.

The minister believes that a base year should be set when the dam should contain the ideal 20 million cubic meters before the beginning of the rainy season. In this way, even if rainfall is below average, there will be enough water in the dam to meet summer needs. This view is of particular importance since the first priority for JVA is the preservation of Jordan's main agricultural investments in the Jordan Valley, namely fruit trees. Any water surplus can then be used in watering vegetable crops, which are usually planted during early summer and also at the beginning of winter.

Accordingly, and to meet the dire water shortage for this year, JVA plans to delay the farming of winter vegetables probably until late October, with the beginning of the rainy season, and when demand on irrigation water begin to recede. "Some of our decisions may not receive the blessing of our farmers, but these decisions are adopted when we have little if no options," said Mr. al-Surur.

Jordan is entering the summer months with only 41 million cubic meters of water in its main dams, including the Wadi Al Arab Dam. It is at this stage that hopes are revived, that work on al-Wahdah Dam, on the Yarmuk River, could resume in the near future. Work on the \$350 million project had to stop because of financing problems. Jordan and Syria had agreed on terms of executing the project three years ago, but political and economic realities have prevented work on this vital water project. If the dam, which needs at least four years to finish, ever sees the light of day, it will hold at least 119 million cubic meters, of which 50 million cubic meters will be allocated for drinking purposes. "We hope that political climate will improve in the region to allow us to continue work on the project," said Mr. al-Surur.

On future water strategy, the minister confessed that Jordan's water resources are scarce and limited, and that "a formula which can retain some sort of a balance between our water potential and water consumption is reached." Meanwhile, the ministry is dedicating its efforts on improving water resources and networks, so as to minimize water losses through seepage, which is estimated at between 18 to 30 percent.

Along with this policy, a review of Jordan's agricultural strategy is required. "The tools of this strategy should be improving production, rationalizing water consumption and focusing on vertical rather than horizontal agricultural expansion, which means increasing yield performance and not farmed space," Mr. al-Surur said. The strategy is closely linked with the ministry's declared objective of focusing on "water harvest" by constructing

as many small and medium dams and water barriers and reservoirs as possible to help in irrigation and watering cattle in the dry months.

Meanwhile, the ministry is paying an increasing attention to the subject of water treatment plants, and is reusing treated water in agriculture. Currently the largest water treatment plant is in Khirbat al-Samra', near Zarqa', which processes Amman's sewage water. But as new areas of the Kingdom are connected to sewage networks, new plants are being built to deal with untreated water, and to re-channel their product into agricultural areas.

"But the most important objective of our water strategy for the future is to achieve regional cooperation to better utilize water resources," Mr. al-Surur proclaimed. "This is particularly vital when dealing with the rights and interests of future generations."

## PAKISTAN

### Plans Drawn To Combat Pollution

BK1805121091 Islamabad Radio Pakistan Network  
in English 1100 GMT 18 May 91

[Text] The Environmental Protection Agency has drawn long and short-term plans to fight against pollution and its hazardous effects on human life in the country. The long-term plan envisages establishment of laboratories and compilation of various statistics, while the short-term plan would mainly emphasize building up public awareness against the hazards of pollution.

## SYRIA

### Deterioration of Desert, Remedies Discussed

#### Needs of Desert Management, Exploitation Examined

91W0405A Damascus AL-BATH in Arabic 26 Feb 91  
p 6

[Article by 'Ali 'Abbud: "What About Management and Exploitation of Semi-Desert's Plant Cover; Low Productivity in More than 60 Percent of Total Pasture Area; Grains Cultivated in Semi-Desert at Expense of Good Pastures; Areas Encroached Upon Are Fearfully Vast and Pose Immediate Threat to Semi-Desert"]

[Text] Even though Syria's semi-desert is extremely important to developing livestock resources, its pastures have been subjected to deterioration for many years and its soil quality has declined by virtue of two fundamental elements: encroachment upon and cultivation of the semi-desert lands, especially in years heralding a good season after successive years of drought. Added to these two elements is the failure of peasant cooperatives to plant pasture shrubs because, on the one hand, the sanctum of these associations is not acknowledged on the

spot and, on the other hand, because the water needed to irrigate the seedlings is unavailable. This has helped the continued deterioration of the semi-desert's plant cover.

Even though the Syrian semi-desert has received and continues to constantly receive great attention from various levels, we have not yet developed the ideal formula for managing and regulating exploitation of the semi-desert and for securing the service<sup>a</sup> which it needs and which befit its importance in the agricultural issue. We can realize this from a careful look at the reality of the semi-desert's plant cover.

### Numerous Causes for Decline of Semi-Desert

As we know, the semi-desert's plant cover is tied to two main factors, namely: Soil and climate. This is why we find that the flora of the western and northwestern part, known as the al-Sham semi-desert, is influenced by the Mediterranean Sea climate whereas the flora of the eastern and southeastern parts is influenced by the continental climate. The influence of the sea and humid winds that it brings leads to a thicker plant cover, contrary to the continental influence which leads to a sparse plant cover. Studies indicate that there are 20 plant communities in the al-Hammad Basin and that their distribution varies from area to area. It is evident that the most prevalent plant community in Syria's al-Hammad is a community of a variety of oriental wormwood [al-shih] and al-rawthah and al-rughul communities. In the al-Sham semi-desert, plant communities vary according to geographic area. The most important plants prevalent in the Syrian semi-desert are:

Nearly eight species of grasses and shrubs.

Three varieties of trees: Tamarisk, terebinth, and (al-suwayd al-filastini).

Pastures constitute 75 percent of the territory of Syria's al-Hammad and represent more than 90 percent of the studied area, amounting to nearly 5 million hectares. But we find that more than 60 percent of these pasture lands are in decline and that their grazing productivity is low. Generally, it can be said that the current condition of the semi-desert is a condition of poor pastures with low productivity because the semi-desert is not protected and because the grazing activity is haphazard.

As an example of what we say, a single hectare in the al-Hammad Basin produces on the average 150 kg of dry plant material and 67 kg of dry grazing material. In al-Sham semi-desert, a single hectare yields in a wet period 248 kg of dry edible material and in a dry period 74 kg of dry edible material, meaning that the general average of the yield per hectare is 161 kg of dry edible material. Thus, we cannot consider the current plant cover and pastures in the Syrian semi-desert a normal condition. Rather, this condition has emanated from the imbalance created by man's intervention and by the following actions:

- Arbitrary grazing practices.
- Cutting shrubbery for firewood.
- Cultivation of large tracts of semi-desert lands



As a result of this haphazard interference in the semi-desert's environment, palatable grazing plants have declined, prickly and unpalatable plants have persisted, and large tracts of the semi-desert lands have been denuded, thus further affecting the plant cover as a consequence of the denudement which has provided the opportunity for the occurrence of sweeping floods whose waters go to waste. Some studies indicate that lands with a thick plant cover curb floods on the one hand and, on the other hand, permit water to seep deep into the soil which absorbs 200 times the volume of rainwater absorbed by denuded lands. All this confirms to us the importance of restoring the semi-desert's plant cover—a cover which helps develop the underground water reservoir.

#### **What About Arbitrary Grazing?**

The arbitrary grazing of the semi-desert's plant cover is one of the most important causes of the decline of this cover. (This decline is due to subjecting pasture lands to common uses). It is noticed that arbitrary and premature grazing has intensified in the past 40 years. Thus, plants no longer have the opportunity for regrowth.

Even though this grazing method has stripped the semi-desert of its basic plants, it continues to be the predominant grazing method. In the past, the protection system preserved pasture plants because grazing was allowed at certain times and within acknowledged traditions that very much resembled primitive grazing cycles which, primitive as they were, had tangible benefits in preserving the plant cover.

#### **Impact of Cutting Shrubbery for Firewood**

Cutting shrubbery for firewood has also had its impact on the disappearance of pasture lands located close to villages and to rural and bedouin residences. An interesting calculation demonstrates the dimensions of the problem emanating from a single act of shrubbery cutting to boil a kettle of tea. Boiling a single kettle of tea requires five woody al-tinah (shrubs). If one bedouin family needs one kettle a day during its presence in the semi-desert and if the average number of families present there is 50,000 then the number of shrubs burnt during 200 days, which is the period extending from the end of autumn to the end of spring, amounts to 50 million shrubs. This enormous volume of just this one kind of plant burnt in 200 days shows us the major impact shrubbery cutting has on the semi-desert plant cover, especially since a single shrub requires five years to become fit to cut. If we add to this the fact that the heating, baking, cooking, and milk-processing activities require ten or more times the volume of wood needed for the tea kettle, then it becomes more and more obvious to us how grave the impact of wood cutting on pasture lands is.

But we have begun to notice that cutting shrubbery for firewood has begun to decrease gradually as a result of the use of petroleum fuels. This cutting has not disappeared and it increases or decreases according to the availability of fuels.

#### **Plough Is Biggest Danger to Semi-Desert**

Despite the significance of the two previous elements, namely arbitrary grazing and shrubbery cutting, in the decline of the semi-desert, farming is the factor that continues to have its impact year after year on the decline of the semi-desert plant cover and on eroding its arable soil. By providing fodder and fuels to the population centers in the semi-desert, the government can, for example, alleviate the impact of arbitrary grazing and of shrubbery cutting. But the problem of farming the semi-desert is extant and persists despite the numerous decrees issued in this regard. Grain cultivation has expanded greatly in recent decades at the expense of natural pasture lands. At the same time, the livestock resources have been affected. It is to be noted that grain cultivation takes place at the expense of the excellent pasture lands surrounding the semi-desert and at the expense of flood lands which are considered a good reserve for palatable grazing plants, especially in dry years. We consider the cultivation of flood lands one of the factors in the decline of the fodder and grazing capacity to less than one tenth [what it used to be]. We should note, meanwhile, that regaining this capacity and improving the pasture lands requires many years.

The danger of semi-desert cultivation lies in the fact that it is unstable because of meager rainfall. Good seasons occur only occasionally. Consequently, the process of ploughing the lands kills the shrubs and pasture grasses, thus leading to soil denudement and to promoting desertification.

#### **Semi-Desert Is Source of Natural Fodders**

All studies agree that the semi-desert is the cradle and source of natural livestock, especially sheep, fodder. It is also an important resource for the production of free natural fodders which must be exploited ideally and protected against deterioration.

The volume of animal fodder which can be produced by the semi-desert could equal 700,000 tons of barley. Moreover, the quality of the natural plants and grasses is suitable for animal nutrition because their humidity does not rise to a harmful level and because they produce a suitable dairy and protein rate, thus securing for livestock their basic nutritional needs.

If we backtrack to years past, we find that exploitation of the semi-desert was confined to grazing and that farming the semi-desert was not known. But the proliferation of agricultural tractors has permitted their owners, along with influential tribal chieftains and the semi-desert inhabitants, to encroach upon semi-desert lands and cultivate and farm them, relying on scarce rainfall. Thus,



semi-desert has come to be exploited for the cultivation of crops in addition to being exploited for grazing.

### Encroachments Upon Semi-Desert Lands

Thus, semi-desert exploiters began their encroachment upon semi-desert lands without being subjected to any punishment. The marginal zone was the first part to be subjected to encroachment, considering that it gets an average rainfall of 200 mm annually. This led to the destruction of the semi-desert's natural pastures and to the decline of its plant cover. Consequently, this encroachment gave rise to food crises for sheep, and farmers were compelled to get rid of many of their sheep herds. In the late 1950's and early 1960's, the country lost nearly one third its livestock. If we examine the consequences of the cultivation and farming of the semi-desert and the marginal zone, we would find the following:

- Shrubs and pasture grasses are exposed to annihilation. This has prevented exploiting the semi-desert (contd) because rains gather in the form of floods instead of seeping deep into the soil.
- Annihilation of the semi-desert reserve pastures in drought years as a result of the (destruction of grasses in flood lands)
- The destruction of shrubs and of (stemmed) grasses has diminished the right conditions needed by seeds to take root and to grow under the semi-desert's climatic conditions
- Cultivation of the semi-desert has intensified the erosion effect of the elements of wind and rain and has accelerated desertification.

If we consider the acreage licensed for cultivation the area encroached upon in the semi-desert, we would find that licensed acreage leaped from nearly 62,000 hectares in 1982-83 to 452,000 hectares in the 1989 season. It increased by 390,000 hectares in six years. On the other side, the figure for the acreage encroached upon is a big figure which varies from year to year, depending on rainfall expectations, i.e. according to drought seasons. Whereas the figure for acreage encroached upon in the 1982-83 season amounted to 68,924 hectares, this figure leapt to 146,664 hectares in the 1986-87 season and then dropped to 22,000 hectares in the dry season of 1988-89. In all cases, these are fearful figures which reflect the great extent of the semi-desert's exploitation.

### How Is the Semi-Desert Exploited at Present

The semi-desert is currently exploited in two ways: irrigated farming and dry farming. Irrigated farming includes the irrigation projects implemented by the government especially the projects on the Euphrates River, Lake al-Asad, and al-Khabur Basin. It also includes farming relying on wells found throughout the desert. Considering that regulations currently in force restrict the allocation of 140 donums for every well

owner in the semi-desert. This owner can exploit the land to cultivate winter and summer crops and fruit trees.

In accordance with legislative decree No. 140 of 1970, amended by law No. 13 of 1973, dry farming is prohibited in the semi-desert for technical and economic reasons. But instructions issued by the Higher Semi-Desert Development Commission have entitled every beneficiary possessing a legal document to exploit 450 donums, of which 80 percent are to be cultivated with wheat and barley and 20 percent with pasture shrubs.

But we notice that farming has gone beyond the limits of the regulations and that many beneficiaries have exploited the instructions to let their tractors plough the land and destroy the pastures. This makes it actually necessary to observe the instructions and to apply them precisely and accurately and with a spirit of high responsibility. It also requires that efforts be made to protect and develop the semi-desert. Perhaps the promulgation of a law which requires those with entitlements to personally exploit their lands and prohibits them from leasing the lands or from letting others exploit them will curtail the chances of manipulation. It is also necessary to emphasize the need for actual residence in the population center adjacent to the exploited land.

### Proposals and Measures To Develop Desert

A symposium on semi-desert development, convened in Damascus in 1982, made several recommendations in the area of semi-desert exploitation. They include creation of more pasture-improvement and livestock-breeding cooperatives to protect the pasture lands and introduction of more government centers specialized in pasture improvement and livestock breeding and in protecting the environment with the objective of enhancing the cooperatives' pasture-improvement activities.

The symposium also recommended the creation of more cooperatives to fatten sheep in the marginal areas or in the areas close to population centers and in irrigated areas. It further recommended that more efforts be channeled toward propagating grazing varieties and to (cross) highly-adaptable grazing plants with the semi-desert's various grazing plants in order to stem desertification and to increase plant productivity. The symposium further recommended that increased attention and support be devoted to cultivating fodders that are economically competitive with the conventional crops, that a network of stores for fodder concentrates be built in the semi-desert, and that studies be conducted on camels and goats to improve the strains and propagate the herds in the semi-desert. The symposium also made several recommendations on the exploitation of water resources. On its part, the People's Assembly recommended in a previous session which discussed the semi-desert that livestock grazing activity be considered the main production activity in the rainwater-irrigated lands of the Syrian semi-desert. The assembly also put the emphasis

on strict protection for the plant cover against farming and against arbitrary grazing through the following:

- Prohibiting the cultivation and farming of lands with any crops other than irrigated crops, and only in lands allocated for population centers.
- Regulating the grazing cycles in order to give pasture plants the opportunity to grow.
- Organizing the distribution of fodder in a manner that reduces premature and arbitrary grazing.

In the area of pasture improvement and development, the assembly recommended that pasture plants and shrubs be cultivated and propagated, that protected areas be expanded within the framework of a well-studied plan, that surface water [reservoirs] be increased, and that underground water exceeding the needs of man and of his livestock be exploited to cultivate grazing plants and green fodder.

#### **Director-General of Desert Basin on Problems, Solutions**

91WN0405B Damascus AL-BA'TH in Arabic  
21 Mar 91 p 5

[Article by Muhammad Farhah: "What Has Happened in Semi-Desert: Has Water Become Available and Has Decline of Plant Cover Ended"]

[Text] Hums—AL-BA'TH Bureau—Whenever the talk touches on the semi-desert basin, it has its concerns and its hopes. Why the concerns and why the hopes? The concerns because of the condition to which the semi-desert has been brought by cultivation and by the loss of the plant and pasture cover and the subsequent exposure of pasture lands to denudement, thus depriving sheep herds of free fodder. The owners of these herds have begun seeking expensive fodders which saddle the government with enormous expenses. These causes are the source of our concern. As for our hopes, they are still attached to the followup by the General Semi-Desert Basin Directorate, supported by the agencies concerned. This followup is done by building numerous surface dams to store water and by drilling new wells so as to develop the natural pastures which we have begun to lose gradually. This development depends on the construction of barriers to distribute water and to plant grazing plants. Before anything else, in what condition is the semi-desert today? What phase has the construction of dams reached? How can we develop the nearly 40 percent of the country's general area that is found in the semi-desert? These three questions were the focal point of our interview with Engineer Dr. Fawwaz 'Abd-al-'Aziz, director-general of the semi-desert basin. So what did he say?

#### **Semi-Desert's Current Reality**

Regarding natural pasture, we do not believe that today's reality is different from yesterday's reality, not to say that it is worse, particularly in this regard. As for building dams and securing water, the situation is totally

different. So, we are facing two parts of an answer. The first part focuses on the condition to which the semi-desert, with its fertile pasture lands, has deteriorated. Pasture lands constitute nearly 80 percent of the semi-desert. This means that nearly 80 percent of the country's livestock live in this basin which has an area of six million hectares, excluding the al-Hammad Basin. The second part concerns the future aspirations for the desert.

Dr. Fawwaz 'Abd-al-'Aziz has said: This wealth of sheep herds lives in the semi-desert for six months. For the sheep to get the fodder they need, i.e., grazing plants, free of charge, the plant cover must be protected and grazing plants must be cultivated. To develop the semi-desert, numerous surface dams have been built in numerous and far-flung areas.

For example, we will cite al-Qaryatayn, al-Wa'r, Wadi Abyad, al-Khashshabiyah, al-Zulfa, and Rishat al-Sa'an dams, as well as seven other dams. The total storage capacity of all these dams amounts to nearly 45 million cubic meters of water. Dr. 'Abd-al-'Aziz added: Since it was created in 1987, the directorate has built several dams, including al-Shaykh Hilal, Abu-Qullah, and Abu-al-Fayyad. We are now building a number of new dams in this semi-desert, namely: Al-Mukharram Dam on which work started this year; (Bulayn) Dam, which is in its first phase; and al-Hissiyat, al-Kaygham, Tadmur [Palmyra], and Arak dams. Al-Hadar Dam will be inaugurated this month as part of our people's celebration of the glorious 8 March revolution. Collectively, these dams have a storage capacity of 28 million cubic meters.

We stop Dr. Fawwaz at this listing of figures to ask the following question: In what condition are the Roman ducts and do you maintain them the way you maintain these dams?

In response, he said: The directorate is currently conducting a number of studies on the construction of irrigation networks on al-Qaryatayn and Wadi Abyad dams to irrigate nearly 650 [as published] hectares of arable land with the objective of making optimal use of the water stored by these two dams during the winter.

#### **Maintenance of Roman Ducts and Reduction of Water Loss**

As for maintenance work, the directorate carries out maintenance work for the constructed dams, including al-Sa'an and al-Khashshabiyah Dams. It has built al-'Albawi side canal to bolster and increase al-'Albawi dam's storage capacity. It also carries out maintenance work for Jibab Shaqra, al-Sukhnah, al-Murabba'ah, and al-Qaryatayn dams.

I will now backtrack to answer the question concerning the Roman ducts. These ducts have special place with us and we devote full attention to them, carrying out maintenance work on them in Tadmur [Palmyra], Arak, al-Sukhnah, Muhin, al-Qaryatayn, and al-Fantar. This maintenance work is periodic and is carried out by the

reasons together caused a significant increase and change in the city's water needs. The need to survey water resources in the basin became pressing, and drawing up a general, comprehensive plan to make the best possible use of these resources for various purposes in the present and in the future was also necessary.

At the Council for Economic Development comprehensive, systematic studies of the most important water resources in the Damascus basin have been carried out since 1959. After responsibility for this council fell to the Ministry of Irrigation and the agencies which are subordinate to it, this series of studies continued. They have continued to date with a few interruptions.

As of 1965, the Public Organization for Drinking Water and Sanitary Drainage in the Province of Damascus pursued a similar course and carried out a series of systematic studies on the al-Fijah Spring and the springs that complement it.

The Ministry of Irrigation and its agencies had agreements to regulate these studies which had various titles. Some of these studies covered several water basins: those of Damascus, Orontes, Aleppo, and the coastal region. Some of these studies were given partial titles, even though they covered in practice most if not all the area of a basin (Barada and al-A'waj). Other studies applied themselves to a specific area of the basin like Harmun.

### Conferences

Interest in the Damascus water basin was not limited to the studies which were carried out by foreign organizations and engineers in the country. Several conferences were held to talk about water resources in the Damascus basin. These include:

1 The First Scientific Conference To Protect Damascus and al-Ghutah was held in 1976. Fourteen research papers were presented at that conference, and three of them were directly related to the Damascus water basin. They are:

- A paper on water pollution in al-Ghutah by Engineer Sa'dallah al-Shawaf
- A paper on the present and future outlook for an irrigation system in al-Ghutah by Muhammad Shafiq al-Safadi
- A paper on sanitary engineering and its importance in Damascus by Engineer Muhammad Yunis

[2] A Scientific Conference on the Pollution of Barada River and Al-Ghutah was held in 1986. It was organized by a branch of the Association of Engineers in the rural areas of the Province of Damascus. Eleven research papers were presented at that conference, which made recommendations on sanitary drainage, treatment plants, installations, sources of pollution, water systems and streams, the water reserve, and other such matters.

[3] The Conference on the Damascus Water Basin is the most recent conference. It was held in October 1990, and

it was organized by the Province of Damascus branch of the Association of Engineers. Among the research papers or studies which were presented at the conference was a study by Engineer Zuhayr Farah Abu Da'ud which summarized the results of previous studies of the Damascus water basin. The results of these studies may be summarized as follows:

The area of the Damascus Water Basin is approximately 10,600 square kilometers. The Barada and al-A'waj basins occupy approximately 8,060 square kilometers of this area. On the average, the water resources in the basin provide approximately 1.6 billion cubic meters of water a year, and that amount comes from different sources distributed approximately as follows:

- Surface water: 400 million cubic meters a year
- Ground water: 500 million cubic meters a year
- Springs: 700 million cubic meters a year

The study estimated that water consumption in 1990 will be about 1.04 billion cubic meters. Consumption of drinking water and water usage for household and industrial purposes will amount to 400 million cubic meters a year, and approximately 640 million cubic meters will be used per year to irrigate 65,000 hectares of farm land.

The volume of water consumption is expected to increase during the last 10 years of this century, and by the year 2000 water consumption is expected to reach approximately 1.96 billion cubic meters a year distributed as follows:

- Drinking water and water for household and industrial purposes: 660 million cubic meters a year
- Irrigation of approximately 116,000 hectares of farm land: 1.3 billion cubic meters a year

Significant differences in water resources and annual differences in these resources must be taken into account to evaluate the situation accurately and properly, regardless of how realistic and how accurate the figures are. Average annual figures do not constitute a suitable basis for evaluating water resources unless the volume of water storage is adequate and large enough to be useful so that an average figure for water resources over the years can be obtained.

And yet, studies concur that a water shortage in the Damascus basin will become apparent in 1990. This has actually happened. Studies show that the shortage will grow rapidly and that it will become necessary to bring water from outside the basin before the year 2000. One of the most important conclusions reached by the studies is the need to build a reservoir on the al-A'waj River to store approximately 180 million cubic meters of water. The reservoir is to be built, on the one hand, so that flood waters from the Barada and al-A'waj rivers can be utilized. On the other hand, water from another area outside the basin can be held in that reservoir.

Because the volume of effluent produced by water usage for household and industrial purposes is significant,

there is general agreement here too that building a water treatment plant is necessary. The plant would be built so that reclaimed, treated water can be used in irrigation and farming. This water would be expected to irrigate more than 16,000 hectares.

#### Drinking Water for Damascus

Among the most important conclusions reached by the studies that were made on developing the al-Fijah Spring are the following:

- The al-Fijah Spring receives water from three sources: the main spring, whose water temperature is low; the 'Ayn Jarush spring, whose water temperature is high; and the lateral springs, whose water temperature is moderate. It is expected that total water flow from these springs will amount to six cubic meters per second if their water flow can be regulated.
- A subterranean barrier has been built to prevent water from al-Fijah Spring from flowing off into the Barada River.
- Facilities have been built for automatically regulating water level at the outlet of the spring to keep it at 825 meters plus.
- Three pumping stations have been built. The first one, which was built for the main spring, has a pumping capacity of four cubic meters per second. Using this pump can reduce water level in the spring to 819 meters plus. The second pumping station was built for the 'Ayn Jarush Spring. It has a pumping capacity of 0.75 cubic meters per second, and it can reduce the water level to 818 meters plus. The third pumping station was built for the lateral springs, and its pumping capacity is 1.5 cubic meters per second. This pumping station can reduce the water level to 816 meters plus.
- Nine wells were drilled in Dayr Maqrin in preparation for pumping 0.4 cubic meters per second.

As of the mid seventies wells were drilled to provide drinking water to areas that were annexed to Damascus. This was done because it was difficult to supply these areas with water from al-Fijah, on the one hand. On the other hand, it was done to supplement the springs of al-Fijah during the periods when water is scarce.

There are 125 wells to date: 100 of them have been furnished with pumping and water purification equipment. The total capacity of these wells is 1.75 cubic meters per second. In 1988 these wells supplied eight percent of the water used by Damascus. In 1989 they supplied 19 percent of the city's water, and in 1990 they supplied as much as 33 percent of the water used by the city.

Law number 10 for 1989 stipulating the creation of a protected, pollution free area around al-Fijah Spring was issued

1. A contiguous, protected area of 0.6 square kilometers includes a rigorously guarded 0.1 square kilometer area owned by the Public Organization for Drinking Water

and Sanitary Drainage since 1973. No agricultural, industrial, commercial, recreational, or residential activity can take place within this protected area.

2. A surrounding protected area of 775 square kilometers includes the basin which supplies al-Fijah Spring with water. The same restrictions which apply to the contiguous, protected area apply to this area. However, people who reside in villages that already exist in this area may cultivate nothing but plants that can thrive on the natural water supply. Residents of those villages may not use pesticides, but they may raise grazing cattle, and they may refurbish existing dwellings.

The new subterranean waterway to bring water to Damascus has been built.

#### Summary

Based on the studies [that were done], we have no doubt that we now have the water shortage we expected to have. Every indication shows that this shortage will get worse. The last decade of this century will be decisive and grave.

Information about water which has been gathered over the years and the results of intense and successive investigations which were conducted on the basin and on the springs in al-Fijah will allow us to determine guaranteed annual water resources for the basin. We can make such a determination if we deal with this information and with the results of these investigations in a proper, methodological manner. We will be able to determine realistically how much of the water in the basin comes from surface water, how much from springs, and how much from ground water. The many studies which were done should also provide information about the different ways in which water is used. They should provide information about changes in water usage, about water usage trends, and about where water is lost, wasted, and squandered. The studies should provide information on water conservation, and they should set guidelines and limits for proper water usage. This study, which, as we said, was presented at the Conference on the Damascus Water Basin concludes by recommending the formation of a joint technical committee made up of specialists from the Ministry of Irrigation and from public organizations for drinking water and sanitary drainage in the Province of Damascus who received and examined the studies. The function of this committee is to be as follows:

- 1. To determine the situation regarding present resources and present consumption based on the conclusions reached by the studies and to set future estimates until the year 2010, if possible, or until the year 2000 at least.
- 2. To point out the gaps and shortcomings of previous investigations and studies and to propose a quick timetable for filling these gaps and correcting these shortcomings.



- 3. To express an opinion on all the measures which must be taken to confront the crisis and avoid the shortage, to set up reasonable priorities among these measures, and to correct the effects of each one of these measures in the present and in the future.

#### **Damascus Population Taxing Water Supply**

91WN0402B Damascus AL-BA'TH in Arabic 27 Feb 91  
p 6

[Article by Ibtisam al-Maghribi: "To Prevent Damascus from Becoming a Waterless City: Available Sources of Water Warn of Shortage in Drinking Water"]

[Text] Given the city's limited water resources, random residential growth in Damascus has brought to the fore a problem which is being exacerbated every day. And yet, no solution is being found to redress its dangers, and nothing is being done to guarantee the availability of water resources which a city of such population density and residential sprawl needs.

#### **Curbing Residential Expansion Must Be Pressed**

A committee was organized years ago by virtue of a decree that was issued by the deputy prime minister for services affairs in 1985. This committee made recommendations for dealing with the water shortage in the city. These recommendations were based on an integrated study of the population of Damascus, the water which is available in the Damascus water basin, and the results which reflect a discrepancy between the drinking water the population needs and what water resources provide. There are recommendations, which were made in 1978, emphasizing that population growth in Damascus is to be regulated in a manner that is proportionate to the amounts of drinking water that are available.

The true, actual number of people who reside in Damascus is unknown. That is why relying on the most recent census, which was conducted in 1981, could definitely lead us to the wrong conclusions if we try to estimate the number of the city's residents in 1990. And if our estimates for 1990 will be wrong, what kind of estimates can we make for the year 2000 and beyond? The number of residents in Damascus is unknown because immigration to Damascus is not subject to any law and is not restricted by any statute. It is random, on the one hand, and it is not based on consideration and planning, on the other. That has caused many residential communities to spring up. Sometimes these communities are law abiding, but most of the time they are not. This phenomenon which is growing every year is presenting an uncivilized image of the city that discredits the city and disfigures its landmarks. This phenomenon constitutes a heavy burden on every study that is done to try and provide water for the city. Furthermore, this phenomenon dooms all such attempts to failure and turns them into useless efforts. Residential communities near Damascus in the area of Harasta and the area of Qadsaya and the violations which are taking place in the two oases south of the city make it incumbent upon officials to contain this sprawl and to determine the true number of people who reside in the city and in the areas around it

so that what they need in drinking water can be determined. This is an issue which must be solved.

#### **Where Is the Water?**

According to the most recent studies Damascus needs approximately 340 million cubic meters of water a year. Since all the sources of water that we know of, those which are in use and those which can be put to use in al-Hawdah, in areas of Mount Hermon, in the two oases south of the city, and the wells in Damascus and in al-Zabdani valley show signs warning us of a shortage in drinking water, not to mention water which must be made available for irrigation and industry, there is a shortage in available water resources in the Damascus basin and in the areas surrounding it. Relying on other, remote sources of water cannot solve the problem because economic costs would be high.

Whereas limiting the proliferation of industries which need large amounts of water in the Barada and al-A'waj basins is the solution seen by the Ministry of Irrigation, the Public Organization for the Water of al-Fijah is proposing the same solution to the Ministry of Housing. The organization is proposing that industrial expansion in Damascus, in the rural areas around the capital, and in the two oases south of the city in particular be curbed. Moving some factories to other provinces may help accomplish that.

#### **Other Means**

Since late 1986 the City of Damascus has been emphasizing that linkage must be established between the plan for Damascus, residential plans, and the amounts of drinking water that are available.

The Public Organization for Water and Sanitary Drainage is trying to have an integrated water system by regulating the various sources of water. It finds it necessary, therefore, to complete a modern sewage system for the city of Damascus because drinking water effluent represents 80 percent of the water that is used. Building the proposed sewage system for the city of Damascus will make it possible to reuse this water which would be usable after treatment. More importantly, doing that would prevent ground water pollution.

#### **The Damascus of the Future**

It is regrettable that no one knows what will happen to Damascus in the future. And that is why many ministries and organizations are pitching in to ward off the danger which is threatening to dry up the city's water supply. These include the Ministry of Housing and Utilities and the ministries of irrigation, agriculture, and electricity as well as the Province of Damascus and the Public Organization for Water and Sanitary Drainage. All these organizations emphasize that a solution has to be found for the residential sprawl and for the residential violations. They emphasize that some industrial organizations or general administrations have to be moved to other provinces because such a solution would make



population growth in the city of Damascus and in the areas around it the subject of observation and study. It would also bring it under control. Consequently, the area's actual water needs can be determined.

In general, having a well-kept, modern water system in Damascus and developing the methods, means, and technology of water usage [to distinguish between] drinking water and water used for irrigation and industrial purposes would mean that a serious effort was underway to combat the phenomenon of wasting water and using it improperly. It would also mean an ideal, civilized use of this substance which is the foundation for every living thing. It follows then, that having that would guarantee all the means which would preserve Damascus culturally and save it from the danger, which is threatening it now, of having its water supply dry up.

#### **Al-Fijah Spring Water Reported To Be Potable**

91WN0402C Damascus AL-BATH in Arabic  
26 Mar 91 p 4

[Article: "Water from Al-Fijah Spring Is Pure Even Though It Appears To Be Turbid"]

[Text] In the last few days residents of the city of Damascus noticed that water from al-Fijah spring was somewhat turbid as it came out of the faucets. They feared that the drinking water might be contaminated. We received many telephone calls from citizens who wanted to know the reason why the water was turbid, especially because a few grocery stores took advantage of the situation and were selling packages of baqin [meaning unknown] at double the price.

We contacted the Al-Fijah Spring Water Organization to inquire, and an official at the organization told us the following: "The only source of water used by the organization to provide the city of Damascus with pure drinking water is the al-Fijah spring. In the last few days water flow from the spring rose to five times its volume. That is why the water is turbid: large quantities of water flow through limited openings and carry some substances which make the water turbid.

"We wish to assure citizens that the water is 100 percent potable and that it is not polluted in any way. The water is closely monitored as usual, and it is tested every day. This turbidity was unexpected, and it will disappear when normal flow is restored to the spring."

#### **Water Shortage Affects Cotton Cultivation**

91WN0402D Damascus AL-BATH in Arabic 27 Feb 91  
p 4

[Article: "The Area of Land Which Was To Be Cultivated with Cotton Is To Be Reduced from 173,000 Hectares to 150,000 Because the Water Situation Is Deteriorating. Distribution of Cotton Cultivation Requirements Is To Begin"]

[Text] Mr. Khadr Fu'ani, director of agricultural affairs and agrarian reform, indicated that agencies which distribute cotton seeds and the necessary production requirements to fellow farmers who plant cotton started distributing those seeds and production requirements in all areas as of the 10th day of this month. He added that fellow farmers in all areas where cotton is cultivated were continuing to prepare the land for cultivating the cotton crop. The season for planting cotton is set to begin on 20 March and will continue till 25 April.

Mr. Fu'ani added that this year's cotton cultivation plan, which was approved by the Supreme Agricultural Council, included the cultivation of 173,000 hectares but that because the water situation in the area of the Orontes, Hims, Hamah, and al-Ghab basin as well as in al-Ghutah is getting worse, that figure has been reduced to 150,200 hectares.

In this regard we hope that fellow farmers who will be planting cotton will plant their cotton in rows and will do so during the period that has been set because planting in rows and doing that during the period which has been set, from 20 March to 25 next April, has many advantages for sprouts and plant growth. It provides the advantage of a high yield cotton crop and early marketing of that crop, and that would provide fellow farmers with a plentiful crop and lucrative prices.

It is to be noted that last year's plan called for cotton to be planted in the same area which was planned for cultivation this year, that is, 173,000 hectares. But that area was reduced to 156,000 hectares for the same reason: the deteriorating water situation in the Orontes, Hims, Hamah, al-Ghab, and al-Ghutah basin. The area to be cultivated with cotton was reduced even though production requirements such as seeds, fertilizers, and good soil preparation, were all available. But it was weather conditions, such as less rainfall and small amounts of ground water, that led to a reduction in the area of land which was to be cultivated with cotton last year and to a similar reduction this season.

#### **Effects of Copious Rainfall, Statistics Reported**

91WN0402E Damascus AL-BATH in Arabic  
25 Mar 91 p 4

[Article: "Rainfall Continues in Provinces; Water Gushing Out of Springs; Water Level in Dams Rising"]

[Text] Heavy rains fell two nights ago in the Province of Tartus: Tartus received 27.7 mm; Safita received 42.1 mm; al-Shaykh Badr, 49 mm; al-Mashta, 33.8 mm; al-Safsafah, 42 mm; al-Duraykish, 49 mm; al-Qadmus, 29 mm; Hamam Wasil, 30 mm; and Baniyas, 18.2 mm. The highest rainfall average this year was in al-Duraykish which received 917.4 mm of rain compared to 749 mm during the same period last season. Al-Shaykh Badr received the second highest rainfall with 780 mm compared with 731.1 mm [last season].

The heavy rainfall caused water to gush out of springs and formed torrential streams in mountain slopes and valleys. It also caused the water level in the province to rise. Heavy rainfall continued in the Province of Hims for the third day in a row as rain fell in all the districts of the province including the semi-desert area where the situation now is favorable with regard to vegetation, pasture land, and water stored in dams. The rain which fell last night in the semi-desert area and the areas around it measured [as follows]: 2.7 mm in Tudmur, 17.7 mm in al-Mukharrem, and 4.5 mm in al-Qaryatayn. The amount of rain which fell last night on the remaining areas was as follows: Hims received 7 mm; al-Nasirah received 68 mm; Shin, 23 mm; al-'Aridah, 28 mm; Talkalakh al-Sad, 36.9 mm; al-Rastan, 5 mm; al-Qusayr, 9.5 mm; and Marmarita received 69 mm.

This rainfall filled the principal dams in the province with large amounts of water: more than 5 million cubic meters in the Qatinah Lake Dam. Water reserves in that dam so far amount to 61.5 million cubic meters. Water reserves in al-Rastan Dam amount to 52.5 cubic meters.

Heavy rains fell in the Province of al-Hasakah in the afternoon and evening of the day before yesterday. Heavy rains also fell yesterday morning. The province had not received such heavy rainfall for years. Sources in the Department of Agriculture and Meteorology indicate that it rained in all the districts of the province but that the amount of rainfall varied between 105 and 2 mm.

The amounts of rainfall so far are as follows: 105 mm in al-Zuhayrah; 64 mm in al-Malikiyah; 54.5 mm in al-Qamishli; 40 mm in al-Ya'rabiya; 36.5 mm in al-Qahtaniyah; 38.5 mm in 'Amuda; 37 mm in Himu; 23 mm in al-Darbasiyah; 27 mm in al-Hawl; 31.5 mm in al-Juwadiyah; 4 mm in al-Hasakah; 2 mm in Umm Midfa' and Tall Tamir; 3 mm in Ra's al-'Ayn, Mabrakah, and al-Shiddayah; and 20 mm in Tall Birak.

The rainfall caused some damage to the network of main and secondary roads, and it damaged a number of public facilities and drinking water establishments in the city of al-Qamishli. The domestic telephone network was also damaged, and scores of villages and farms were isolated from cities and towns.

Until the day before yesterday the rain which fell on the Province of al-Suwayda' this year was as follows: 315 mm in Salkhad; 282 mm in Shahba; 517 mm in 'Ayn al-'Arab; 263 mm in al-Suwayda'; and 136 mm in al-Surah. This rainfall is considered good, and that will yield a good season.

The amount of rain which fell in the Province of al-Riqqah in the last two days is as follows: 27 mm in al-Riqqah, 66.6 mm in al-Sat, 3.5 mm in Ma'din, 36 mm in al-Mansurah, 27 mm in Jarniyah, 41 mm in al-Karamah, 71 mm in Judaydah Khabur, 24.6 mm in Tall Abyad, 24.6 mm in 'Ayn 'Isa, and 32 mm in Muhaysin.

Sources in the Department of Agriculture affirming that this rainfall which exceeded the annual average rainfall in al-Riqqah, al-Sabkhab, al-Mansurah, and Judaydah Khabur promises a season of abundance.

The sources indicated that the rain which fell on the semi-desert area promises to cover the soil with the necessary vegetation that will provide sufficient grazing material to feed the 1.7 million heads of sheep in the province.

#### Arsenic Pollution of Quwayq River Discussed

91WN0402F Damascus AL-BATH in Arabic 4 pp. 100 words p. 5

[Article by 'Amir 'Ulaywi from Aleppo. "The Implications of Using Contaminated Water from Quwayq River To Irrigate Vegetables"]

[Text] Important chemical tests are constantly being performed in the Automatic Research Testing Laboratory in the College of Science at Aleppo University. The most important problem to which the lab is trying to contribute a solution may be that of environmental pollution, which is considered the biggest and most serious problem facing the world at the present time.

Working under the supervision of Dr. Ahmad 'Abd al-Ramadan, Dr. Husnah al-Mandil conducted an extremely important chemical-environmental study entitled "A Volt-Ampere Polarization Analysis and a Cumulative Metric Analysis To Determine Arsenic Contamination." The study dealt with the contamination of vegetables and plants, especially those which are planted around the Quwayq riverbed in Aleppo and those which are irrigated with contaminated water from the Quwayq.

The result of this study shows that these plants are contaminated and that they contain large quantities of arsenic. The study showed that the amount of arsenic in those plants exceeded the amounts which are permissible worldwide. That is why agencies which are responsible for such matters have to impose measures by means of which farm land surrounding the riverbed should be constantly monitored. They are to prohibit the use of water from this river, which is sewage water and industrial waste water, for irrigating plants and vegetables which are used by man as food.

It may be that we find ourselves compelled to point out the significant danger posed by increasing the amount of arsenic beyond what is permissible. The first such danger is the effect arsenic has on the function of enzymes in the human body: it stops the enzymes from functioning. If arsenic exceeds the limit which a human body can tolerate, death results. Herein lies the danger of this very toxic substance which accumulates in the body, unknown to the individual. When the amount of arsenic in the body exceeds [the safe limit], symptoms appear suddenly, but by then it is too late.

In an interview we conducted with her, Dr. Husnah al-Mandil explained to us the effect that arsenic has on many vegetables, especially those which are grown in the riverbed of Quwayq River where the soil contains large amounts of arsenic. The various samples she utilized in her study were as follows: 1. Vegetable samples irrigated with drinking water and cultivated in uncontaminated soil.

2. Vegetable samples irrigated with well water and cultivated in uncontaminated soil.

3. Vegetable samples irrigated with contaminated water from the Quwayq River in Aleppo and cultivated in uncontaminated soil.

4. Vegetable samples irrigated with contaminated water from the Quwayq River and cultivated in contaminated soil.

5. Soil samples collected from the same places from which the vegetable samples were taken.

6. A variety of tobacco samples.

The results of the study and the tests showed that vegetables grown in contaminated soil and irrigated with contaminated water from the Quwayq River contained a large amount of arsenic: up to 3.10 milligrams per kg in the leaves and up to 2.27 mg per kg in the fruits. This amount is three times the amount permissible for human and animal consumption, which is estimated to be one mg per kg.

The amount of arsenic found in the edible portions of vegetables irrigated with contaminated water and grown in uncontaminated soil was 0.99 mg per kg. The amount of arsenic in vegetables irrigated with uncontaminated water was less than 0.4 mg per kg.

The amount of arsenic found in various tobacco samples was between 0.26 to 0.7 mg per kg. When the amount of arsenic found [in the samples] is compared with the amount which is permissible for human and animal consumption, we find that the amount of arsenic found in the samples which are irrigated with contaminated water and grown in uncontaminated soil comes close to the upper permissible limit. But the samples which were irrigated with contaminated water and grown in contaminated soil contained much more arsenic than the permissible amount. It is therefore imperative that water from the Quwayq River not be used for irrigation purposes before it is purified or before the sources of contamination are identified. Those who are contaminating the water must be prevented from discharging their toxic waste into the river.

Dr. al-Mandil affirmed that agencies whose job it is to look for the sources of pollution in the Quwayq River must devote their attention to this matter. They must determine where this pollution is coming from so that measures can be taken to prevent those polluters from discharging their waste into this river. Dr. al-Mandil also

referred to the sanitary drainage project which is presently underway. She said that although this project will rid the water of the Quwayq River of biological contamination, polluters will continue to discharge toxic substances into the river. That is why polluters must be identified and kept away from the river. It is then that the sanitary drainage project in Aleppo will become more useful.

### Province of Al-Ladhiqiyah Said To Need More Dams

91W'N0402G Damascus AL-BATH in Arabic 4 Apr 91 p 5

[Article by Muhammad al-Daghn from al-Ladhiqiyah: "How Do We Avoid Losses in Agricultural Crops? Does Planning Provide Balance in the Market?"]

[Excerpts] [Passage omitted]

### What About the Rainfall this Season?

As long as we are on the subject of agriculture, [we should point out] that rainfall plays an important role in that regard. People in the Province of al-Ladhiqiyah are preoccupied with the rain. They turn their eyes up to the sky and ask for more rain. Although no clear figures about the rainfall this March have been issued, the news is promising. It has been raining almost continuously since the beginning of the month. The month of February, that is, last month, may be considered the rainy month in the Province of al-Ladhiqiyah. The rainfall then was more than 75 mm and exceeded the total amount of rainfall this winter of 350 mm [as published]. And yet, we continue to wait for more rain. The Province of al-Ladhiqiyah is one of the fortunate provinces as far as rainfall is concerned since it receives about 900 mm of rain. A simple calculation shows that the rain which fell in al-Ladhiqiyah was not much more than one third the rain that usually falls there. Although the vegetation may not need large amounts of rainfall now, the new reservoir dams do. The rain will fill them with water. It seems the fields will have a pressing need for this water next summer.

Reports submitted by the offices of agriculture in the province to the Department of Agriculture in al-Ladhiqiyah indicate that the wheat crop is in good shape and that the almond, citrus, tobacco, and vegetable crops are also in good shape.

People are setting their hopes on the expected rainfall. They hope the rain will stabilize the ground water situation in the coastal basin so that the springs which have been dry since last summer can burst forth with water. The need for more rainfall is dictated by the nature of the new agricultural life in the Province of al-Ladhiqiyah where land reclamation projects in the province and a shift from rainfall to the use of irrigation in large areas of land are ultimately adding to water needs. In addition, there has been a tendency among people in recent years to turn to irrigated farming, to use

greenhouses, and to reclaim their land in an attempt to utilize every square meter of land. Demand for water has grown, especially after hundreds of new wells were drilled and irrigation systems became longer: those along the 16 October Dam as well as those in Jablah. We are also saying that the heavy cultivation of citrus fruits in the Province of al-Ladhiqiyah means that we need more water because citrus trees are known to have a voracious appetite for water.

Although the Province of al-Ladhiqiyah has more dams than any other province, it still needs more so that the torrential streams which flow down the mountain sides and through the valleys on their way to the sea can be collected and stored in reservoirs. Actually, the General Administration for the Coastal Basin did carry out many projects and is still planning to build many more reservoir dams, all of which would prevent the loss of rain water which flows into the sea. The amount of water that flows into the sea and is lost is tremendous, even though that amount has been decreased significantly after a system of dams was built. In conclusion, it may be said that if all the locations that are suitable for building dams in the province were used, it would be possible for us to say that the rain we have had so far was enough to fill most dams. We would have been able to safeguard an important reserve supply of water for irrigation purposes during the days of summer.

### **Thousands of Donums in Baniyas Threatened by Drought**

91W'N0402H Damascus AL-THAWRAH in Arabic  
24 Mar 91 p 5

[Article by Haytham Yahya Muhammad: "Drought Threatens Trees in 10,000 Donums in Baniyas"]

[Text] When the annual conference of the Tartus Farmers' Union was being held in mid February, last month, the president of the Baniyas Farmers' League raised an important issue which had to do with 10,000 donums of land owned by the farmers of the Huraysun Society. Thousands of citrus trees grow on this land which also has greenhouses where pre-season vegetables are grown. To put it briefly, the issue here is the threat of tremendous damage to this land because the amount of water in the Surit Dam in the summer is small. There are 3,000 donums which face the risk of being inundated with water during the winter. When that happens, all the trees and plants grown on that land are destroyed because there are no regular drainage canals on that land even though the area is subject to an irrigation system.

Our report in this issue of the newspaper will deal with all aspects of this question. It follows a field tour we took a few days ago in Huraysun and al-Qulu', the subject of the problem. We were accompanied on that tour by the president of the Baniyas Farmers' League; by Muhammad Kafa, an agricultural engineer and the chief of the Irrigation Office in the Agriculture Department of Tartus. We took this tour at the behest of the minister of

agriculture. Both the minister and Mr. Sharif Jayuh, the agricultural supervisor in Tartus, had directed us to take this tour when the conference was in session.

### **The Suffering Started Two Years Ago**

Three years ago the General Department of Irrigation in the Coastal Basin, which is subordinate to the Ministry of Irrigation, built principal and secondary irrigation canals from Surit River. These canals, which were five km long, were built to irrigate over 10,000 donums of land in Huraysun owned by farmers. Citrus trees had been planted on the land and scores of greenhouses had been set up on it. Pre-season vegetables and peanuts are grown in some of these greenhouses.

The farmers started suffering during the past two years of drought when water became very scarce and there wasn't enough to irrigate the trees and the plants. The main reason for that is that water from the dam is carried from the bottom of the dam to ponds for raising fish through a 40-inch diameter subterranean canal. These ponds belong to the Public Organization for Fish, which is located in the area and occupies 1,000 donums. That is why the remaining water is not enough for the land whose need for the water during many months of the year is pressing. The water is needed because farmers are not allowed to open ground water wells in the area because the area is subject to an irrigation system that is supposed to provide water from the irrigation canals which have already been built. We realized the magnitude of the real problem the farmers have been experiencing when we toured the village of Huraysun and the village of al-Qulu' and when we walked through the land in both villages and met with a number of farmers who were suffering when they talked with us about their problem which is threatening their land, their trees, and their plants. They are facing the threat of becoming unproductive year in year out. If remedial action is delayed, the trees and plants may die.

The farmers are using our newspaper to appeal to responsible agencies and to the ministries of agriculture and irrigation to remedy this problem promptly. It is a problem which is threatening more than 10,000 donums of irrigated land which is considered the most fertile land in the coastal region. It is a problem which is also threatening the state owned al-Hurriyah Farm, which receives the water it needs from the Surit River too.

We visited the fishery which is affiliated with the Public Organization for Fish in the course of our tour, and we met with its director and with a few technicians. We asked them about the ponds where the fish are raised, and we asked them about their water needs and about how they deal with the water problem. They assured us that they need a very large amount of water from the dam, especially during the summer. They said that their need for water depends upon the requirements of breeding and raising the fish. The total area of the fishery is more than 800 donums: 500 out of the 800 donums are ponds which receive water from Surit Dam by means of



a subterranean canal whose diameter is 70 cm. The fishery has special ponds for breeding and raising the fish: 13 ponds to promote growth and development, 13 hatcheries, 3 ponds for intensive breeding, 3 ponds for incubation purposes, and nine ponds where water is always flowing. The fish which are bred and raised in these ponds are carp and al-misht (meaning unknown). In addition, the fishery also produces roe.

It is the opinion of management at the fishery that radical measures to deal with the water shortage problem are unavoidable so that water to irrigate land in Huraysun can be provided. It must be pointed out that water from the Surit River is not enough for this land in the summer even if we were to stop supplying the fishery with water from that river.

#### **Suggestions for a Solution**

The question is this: How can this problem be dealt with? What are the proposals which can, if implemented, deal with this issue before it is too late?

The first suggestion is for the Fish Organization to drill ground water wells so it can have enough water for its ponds. It could then do without the water it receives from the Surit River. The second suggestion involves pumping enough water from al-Sin Lake into the Surit River in the summer to cover the needs of the land as well as those of the fishery. If this cannot be done, a large dam is to be built on the Surit River to store all the water which is lost from the river when it flows into the sea in winter when water at the source is abundant. This is what we noticed during our recent visit to the source. If that too cannot be done, ground water wells in the area have to be opened. This could be done at the expense of the Ministry of Irrigation, or farmers could be permitted to open these wells and incorporate them into the irrigation system. Since ground water is available and plentiful in the area, water from these wells can be carried through the canals which have already been built.

#### **Becoming Inundated in Winter**

The second problem which afflicts farmers in the area is that more than 3,000 donums of their land is inundated in winter. Their plants die as a result of that. This is what we saw with our own eyes. In fact, dry rot is a threat to a significant portion of the citrus trees which can be found on this land: the leaves on those trees turn yellow and then fall off. It seems that this problem is caused by the fact that drainage canals were not built on this land which, as we mentioned, is located in an area that is subject to the irrigation system of the Ministry of Irrigation. Farmers are making tireless efforts and suffering major losses to overcome this problem singlehandedly, but to no avail. One of the methods they are following in this regard involves digging ditches on their land around the greenhouses to prevent water from getting inside the greenhouses. They also bring in new soil which they use to fill up their land. And yet, the problem continues to

get worse. It is having a negative effect on the farmers and on agricultural production every year.

Every farmer we met during the tour talked about the suffering he and his neighbors were experiencing because of this problem. Each one of them emphasized that it was necessary for the Ministry of Irrigation to set up the drainage systems which it finds appropriate for this land. We too are asking the Ministry of Irrigation and the Public Department of Irrigation for the Coastal Basin and its branch office in Baniyas to do the same, and we hope that they will solve this problem without delay.

We are bringing the particulars of these two questions to the attention of the minister of agriculture and the minister of irrigation, and we are hoping that both of them will deal with these problems radically and with the required speed. We will continue talking about these problems in light of the new measures which the peasants are patiently awaiting.

#### **Disrepair of Pumping Equipment Criticized**

91WN04021 Damascus AL-BATH in Arabic 21 Mar 91  
p 5

[Article by Major Rayis 'Ali from the newspaper's office in al-Ladhiqiyah: "Water Projects and No Equipment: A Problem"]

[Text] We published an interview with Engineer 'Ali Mayhub, the director of al-Ladhiqiyah Water [Authority] last July. In that interview Mr. Mayhub spoke about the repeated malfunctions of the pumps at the al-Sin Lake Pumping Station which provides al-Ladhiqiyah with drinking water. At that time we said that the coastal area could not have a shortage in its water resources in the foreseeable future, and we pointed out that the water reserve was enormous: there was water in the lake and in ground water reservoirs.

Now that the pumps have been repaired, why do we still have rationing hours? Why aren't we getting water in a normal fashion, and why can't we get water to the moderately high floors [in apartment buildings], never mind the very high floors, without using special pumps to pump the water to them?

Why is it that a considerable number of projects to extend water services into some areas, villages, and neighborhoods or to supplement the water system with additional supplies of water are now at a standstill and have not been completed? We talked with Engineer Muhammad Saydawi, technical director at the al-Ladhiqiyah Water Organization in an attempt to find answers to these two major questions. Mr. Saydawi gave us a briefing on the present capabilities of the organization which is afflicted with a chronic equipment shortage.

What we're talking about here is everything which is required to build water carrying lines. We are talking



here in particular about ground water pipes which constitute the foundation of everything the organization does. Engineer Sidawi pointed out that one of the most important projects whose completion awaits the availability of ground water pipes is the al-Jandiriyah Project which supplies the water system with between 25,000 and 30,000 cubic meters of water a day. He called attention also to other projects which include modernizing and renovating the old system which is directly responsible for weak water pressure and for the fact that water does not reach the top floors [in apartment buildings]. This is due to the major expansion in housing and to the fact that this expansion is not compatible with the present system. He affirmed that in the next three years special pumps that will pump water to the fourth and lower floors will no longer be needed because, according to Mr. Sidawi, water will flow under the regular pressure which is universally applicable. For floors above the fourth floor, large common tanks must be built and placed on the roofs of buildings. Each building would then have one pump which would be used to pump water to the tank. Water would then flow spontaneously from the tank to the top floors of a building, starting with the fifth floor and every floor above it.

According to Engineer Sidawi this is the practice that is followed worldwide. In addition, there is a plan to bring drinking water to the suburb of Buqa which has been suffering for years and continues to suffer as it waits for water. And there is the Jurin water project to bring drinking water to Silinfah.

There are, in addition, many small projects that have one thing in common: they are all at a standstill waiting for the arrival of ground water pipes primarily and then for the other requirements which must be available for the completion of these important projects which must be given priority by those agencies which attend to such matters and are responsible for them.

#### **Solution Urged for Water Crisis in Al-Qalamun**

91WN0402J Damascus AL-BATH in Arabic 27 Feb 91  
p 6

[Article: "Should Al-Qalamun Be Allowed To Become Victim of Drought? Incomplete Studies and Floundering Solutions"]

[Text] The District of al-Qalamun with its residential communities of approximately 15 towns and villages is afflicted with a problem that defies solutions. The district's population must have doubled since 1981 when the number of people living in that district was 100,000. Who is not aware of these facts and who is not aware of the fact that the district is suffering from a water shortage? To put it more clearly, who is not aware of the drought problem?

Although those who are responsible for such matters gave this matter their attention, performed the studies

that were needed, and looked for the necessary solutions to the problem, that attention often lost its fervor and the studies often floundered.

Solutions ran the gamut of making maximum use of the waters of al-Qalamun basin and relying on water from the Orontes River. But neither proposal is anywhere close to a solution since neither has been the subject of study and debate. [In the meantime] al-Qalamun continues to experience every day more of the consequences of that situation whose effects can be seen on all aspects of human life in the district.

#### **Preliminaries to this Outcome**

The drought in the District of al-Qalamun may be due to natural causes, primarily the geological makeup of the terrain in the district and prevailing climate and rainfall conditions. However, the lack of studies and the failure to find a solution to the drought problem have nothing to do with the terrain or the climate. The situation we are facing is one whose most salient features are backward agricultural practices and a cultivated area that is shrinking. Consequently, what we are facing is an economic phenomenon that is not sound and a social life that is not healthy. To change the status quo we have to make serious and intense efforts to find out how much water is really available in al-Qalamun basin.

One study conducted by the Office of Ground Water in the Ministry of Public Works shows there is ground water in the district. This study, which dates back to 1959, is described by those who supervised it as one that is based on conjectures and independent opinions with many possible interpretations. The study, which relies sometimes on making comparisons with some neighboring districts that were studied, does not provide a true picture of the ground water situation in the district since the results of those studies that were done on neighboring districts were applied generally to some of the areas, springs, and wells in al-Qalamun. Therefore, the study is incomplete and incompatible with modern studies, and its proposed solutions cannot solve the shortage, particularly since the study was based on a geological survey that was done in 1945.

When we add to all that the fact that water flow from springs is declining, that water pumping operations are carried out at random, and that wells are being drilled without any regulations, it becomes obvious that the drought is becoming more severe and that the problem is getting worse over the years.

#### **A Study That Did Not Succeed**

Regarding the proposed solution of drawing water from the Orontes River at the rate of 650 liters per second, the prime minister's office requested on 9 November 1986 that this amount be reduced to 300 liters per second. And yet, the project floundered when it ran headlong into the high economic cost. It became one more solution that floundered and continues to flounder to this day.

#### **Those Responsible for a Solution**

The agencies which have the responsibility and the qualifications for finding an answer to this question are the Ministry of Irrigation, the General Company for Water Studies in Hims, the Office of Ground Water in the Ministry of Public Works, and the Supreme Planning Council. These agencies are either not serious about saving the District of al-Qalamun or they are not able to save it from its ordeal.

The fact that the cultivated terrain is shrinking has become clear. District residents are now turning their backs on farming and looking for other ways to earn a living. This means that people are migrating from the district despite the dangers and consequences of such migrations.

#### **Migration from al-Qalamun**

All over al-Qalamun people who can work have left the district. Some of them went to neighboring Arab countries, and others took a shortcut and went to Damascus and its suburbs. A number of these immigrants may be fortunate enough to find suitable employment, but most of them by and large suffer from hidden unemployment

since most of the work they do cannot in any way be classified as real economic production. What they do is rather classified under services. And then, some of the district's residents resort to smuggling contraband goods.

All these conditions have negative effects on the district and on its residents. Their effects on social life there are also negative. Will the District of al-Qalamun be left to face the dangers and consequences of the drought which have a profound effect on human life there? Will the studies that were done on the area give this matter serious attention? Will something be done to fill the gaps in those studies? Will irrigation projects which are related to drinking water and which were completed in some villages in the district be put to good use? Very deep wells were drilled in those villages, but equipment for drawing water and pipelines for carrying the water have not been completed. Will these projects be put to good use? Will the process of drawing the remaining water in the basin be regulated? Will the many wells that were drilled in every home and in every parcel of land be removed? Although none of these solutions is a comprehensive solution, they are all stopgap measures which may be useful in providing a quick solution to the lack of water for residents of the District of al-Qalamun.

### **Berlin Institute Highlights Soviet Environmental Problems**

*LD1505172891 Hamburg DPA in German 2309 GMT 14 May 91*

[Text] Berlin (DPA/VWD)—An environmental protection industry and an effective environmental administration should be built up in the USSR with Western aid. Additionally the extent of damage to the environment, until now only estimated, must be recorded more accurately. These suggestions were made by the German Institute of Economic Research (DIW, Berlin) in an investigation published in their most recent weekly report on environmental problems in the USSR.

The Soviet environmental crisis is the result of economic growth based on a constant input. The low natural resource and energy prices had encouraged waste. Another reason is that land and water can be used free or at a minimal charge. The subsidy of unprofitable factories has meant there has been no compulsion to be thrifty as far as available resources are concerned. Moreover, equipment has been used over a far longer time period than is usual in the West. In the electricity, iron and steel industries, which heavily burden the environment, the average usage of equipment capacity is about 50 years.

In the USSR the 17 million tonnes of sulphur dioxide emitted is as much as all the EC countries put together, writes the DIW. Only 28 percent of sewage in need of purification was treated in 1989 in accordance with Soviet regulations. Toxic waste is usually left in completely unprotected dumps. The numerous nuclear plants present a huge danger. The crisis in the USSR can not be solved by taking "postenvironmental damage" measures but can only be resolved by a change in structure and economic fundamental modernization.

### **World Health Assembly on Chernobyl Aid**

*LD1605100691 Moscow TASS in English 2125 GMT 15 May 91*

[By TASS correspondent Vitaliy Makarchev]

[Text] Geneva May 15 TASS—The session of the World Health Assembly, now under way in Geneva, adopted a resolution calling on all countries to participate in the implementation of the international Chernobyl programme.

Assembly participants requested the director-general of the World Health Organisation (WHO) to find additional extra-budgetary funds to finance the programme.

The outlines of the programme, the aim of which is to give medical and preventive aid to people afflicted by the Chernobyl disaster, were drafted at the initiative of the Soviet Public Health Ministry and the WHO a year ago.

Some measures are now being fulfilled under the programme in the USSR. Preparations are now in progress

for mass and detailed medical checkup of people in stricken areas, and equipment and medicine are being purchased to treat children.

An international medical radiation centre is being established in Obninsk and its regional branches in the Ukraine, Belorussia and the Bryansk region, Russian Federation.

Soviet Public Health Minister Igor Denisov, head of the Soviet delegation at the assembly, said in an interview with TASS that the resolution is another step towards an international system of aid to people, whose health was afflicted by the Chernobyl disaster.

### **Results of IAEA Report on Chernobyl Disaster Outlined**

*OW1905065591 Tokyo KYODO in English 0606 GMT 19 May 91*

[Text] Tokyo, May 19 KYODO—A committee of the International Atomic Energy Agency (IAEA) has concluded that the 1986 disaster at the Chernobyl Nuclear Power Plant caused no direct radiological health damage on people, according to a report obtained by KYODO NEWS SERVICE.

The International Advisory Committee of the IAEA assessed the consequences of the nuclear plant disaster and evaluated Soviet protective measures from May to December last year. The committee was established in October 1989 at the request of the Soviet Union.

The International Chernobyl Project, conducted by more than 100 experts from 29 countries and international organizations, focused on people now living in the contaminated areas and the radiological health effects on more than 100,000 people evacuated from the prohibited zone around Chernobyl.

The project did not address health effects on the large number of emergency workers who were brought into the region temporarily for accident management and recovery work, the report said.

"Reported adverse health effects attributed to radiation have not been substantiated either by those local studies which were adequately performed or the studies under the project," the report said.

"The official data that were examined did not indicate a marked increase in the incidence of leukemia or cancers," said the report, which is to be made public at an IAEA meeting opening in Vienna on Tuesday.

A "future increase over the natural incidence of cancers or hereditary effects would be difficult to discern, even with large, well-designed, long-term epidemiological studies," the report said.

"Reported estimates of absorbed thyroid dose in children are such that there may be a statistically detectable increase in the incidence of thyroid tumors in the future," it said.

The radioactive contamination of both drinking water and food was in most cases below permissible levels, the report said, adding that the project's estimates of contaminated settlements were lower than the officially reported estimates.

The report said, however, "The accident had substantial negative psychological consequences in terms of anxiety and stress due to the continuing and high levels of uncertainty, the occurrence of which extended beyond the contaminated areas of concern. These were compounded by socioeconomic and political changes occurring in the USSR."

"The protective measures taken or planned for the longer term, albeit well intentioned, generally exceed what would have been strictly necessary from a radiological protection viewpoint," it said.

Any relaxation of current policy, however, would probably be counterproductive because of the high levels of stress and anxiety among inhabitants of the contaminated areas, the report said.

Itsuzo Sigematsu, chairman of the committee and director general of the Hiroshima-based Radiation Effect Research Foundation, said the report is the best comprehensive assessment now available on the effects of the nuclear disaster and will serve as basic data for future international cooperation.

However, Jinzaburo Takagi, a nuclear expert, accused the IAEA of intentionally underestimating the impact of the Chernobyl disaster.

Experts also fear the possible health effects of low-level, long-term radiation as wide areas are still polluted by radioactivity.

According to the Soviet Public Health Ministry, 31 people have died from massive radiation exposure following the accident which took place on April 26, 1986.

#### **Figures on Deaths Among Chernobyl Workers Disputed**

*LD2005120791 Moscow TASS International Service in Russian 1110 GMT 20 May 91*

[Text] Moscow, 20 May (TASS)—Recently reports have appeared in the media of the USSR and abroad on the large number of participants in the elimination of the consequences of the accident at the Chernobyl Nuclear Power Station who have died as a result of the effect of ionizing radiation. Thus, the weekly ARGUMENTY I FAKTY gives a report of 7,000-10,000 dead.

Your TASS correspondent has asked the USSR Health Ministry to elucidate this matter. This is what he has

been told—145 people have fallen ill with acute radiation sickness, 30 of whom have died; 275,614 participants in the elimination of the consequences of the accident at the station were under observation by medical establishments of the system of the USSR Health Ministry at the end of 1990. According to statistical accounts in the possession of the USSR Health Ministry, in 1990 1,065 of these persons died in the Ukraine, Belorussia, and the Russian Soviet Federated Socialist Republic for various reasons.

Predominant among the causes of death are accidents, poisoning, injuries, and general somatic illnesses, corresponding to the mortality structure among men between the ages of 20 and 49 as a whole in the country.

#### **Former Deputy Chief Engineer Recounts Chernobyl Events**

*91WN0437A Kiev KOMSOMOLSKOYE ZNAMYA in Russian 20 Apr 91 pp 4-5*

[Interview with Anatoliy Stepanovich Dyatlov, former deputy chief engineer of the Chernobyl AES, by A. Budnitskiy and V. Smaga, KOMSOMOLSKOYE ZNAMYA correspondents, in Kiev; date not given: "The Reactor Had To Explode..."]

[Text] A new development project in Kiev. A standard apartment house constructed from prefabricated panels. The door is padded with imitation leather. We ring. It is opened by a tall man thin with disease. An intelligent and attentive gaze from beneath his whitish eyebrows. He smiles affably, extends his hand.... Only as we shook hands did we inadvertently notice the blotches of the radioactive burns on them. Pale pink, but noticeable blotches.... This is A.S. Dyatlov, former deputy chief engineer of the Chernobyl AES [nuclear electric power station]. Convicted and sentenced—to blame, that is, for the entire well-known crime. The law and the public have seen Dyatlov as one of the principal "authors" of one of the greatest disasters of the 20th century. Anatoliy Stepanovich returned home quite recently. From the "slammer"—the term he uses for the regular-regime correctional labor colony where in the intervening years he has served out his punishment under Article 220 of the UkSSR Criminal Code. There is no point in concealing it: When we came, we thought of Dyatlov as a criminal. But when we left his apartment, we felt we were leaving the home of a victim. Our intention had been to denounce, but we were compelled to sympathize.... And to agree.

[KOMSOMOLSKOYE ZNAMYA] Tell us a little bit about yourself. People say that before you worked at the Chernobyl AES you worked on the power plants of nuclear submarines in the Far East.

[Dyatlov] Yes, that is so. I was born near Krasnoyarsk in 1931. By education and my work experience, I am a qualified specialist in the operation of nuclear power plants. I like my work in the Far East. But once, when I was on vacation, I stopped by the Chernobyl AES, which



was then under construction. And I reached agreement with Viktor Petrovich Bryukhanov, the director, that I would take the position of deputy shop chief. At Chernobyl, I took part in the installation, startup, and operation of all four power generating units. When the investigation was conducted, it all came down to putting the blame on operating personnel, and above all on Dyatlov. But the personnel of the Chernobyl AES nevertheless reasoned that the accident was not their fault at all. That is why during the trial the overwhelming majority of the witnesses did not deny my competence. What is more, the trial record itself, in my view, convincingly proves that the plant's operating personnel were innocent.

[KOMSOMOLSKOYE ZNAMYA] But the verdict, as everyone knows, was quite different. How do you explain that?

[Dyatlov] The verdict could not have been otherwise. I could object, but you could not name a single case when anyone has been punished for the most important accidents in recent years except the dispatchers, the operators, the ship captains, and other "switchmen." The point about this was well-made in a letter printed in the magazine MOLODAYA GVARDIYA from the mine rescue workers in Donetsk Oblast, who were called in when a mine filled with poisonous gas: "A system has been created and operates effectively to remove responsibility from those principally to blame for scandalous things. The monopolist himself investigates the accident, he himself outlines the measures to be taken, and he follows up their performance."

That is exactly how it was with us at the Chernobyl plant. Not a single commission, and there were several of them, included representatives of the operating personnel, that is, those who were blamed for the accident. The commissions consisted only of the potential, and sometimes even actual, perpetrators of the disaster. They could not have been expected to conduct an objective investigation. And there was none. And no attention whatsoever was paid to the material refuting the generally accepted version in the interdepartmental scientific-technical councils on 2 and 17 July 1986, which were chaired by A.P. Aleksandrov, member of the academy. A conception was in fact worked out in those conferences that relieved the designers of the equipment of responsibility and passed all the blame onto the personnel. The material of those conferences was the basis for the report of the government commission, which was made to the Politburo of the CPSU Central Committee, to the USSR Council of Ministers, and to the IAEA [International Atomic Energy Agency].

Is there any reason to be surprised that the decisions of the Politburo should have spoken clearly about our guilt? It would have been extremely naive, then, to count on the court's objectivity.

To be sure, an unlikely statement was made from the platform of the 28th CPSU Congress to the effect that

the Politburo and government had not gained an understanding of the causes of the Chernobyl accident. No, it is not true that they "did not gain an understanding," they did not want to figure it out! After all, no one prevented the supreme bodies of government from calling on the best scientists to analyze the causes of the accident, to study carefully what we might call the history of the matter....

[KOMSOMOLSKOYE ZNAMYA] So, the Chernobyl disaster had certain prerequisites?

[Dyatlov] Prerequisites? That is not the right word! That is how an official explanation of what happened sounds. The accident occurred because of the improbable coincidence of several flagrant violations of the standards and rules of operating a power generating unit by the attendant personnel. But it is not difficult for me to prove that the RBMK-1000 reactor inevitably had to explode somewhere. Facts like that are practically unknown to the public.

In 1975, there was an accident at the Leningrad AES: A channel ruptured on the same kind of reactor as at Chernobyl. A commission consisting of staff members of the Atomic Energy Institute imeni Kurchatov analyzed what had happened and drafted a list of recommendations for improving the reactor's reliability, including recommendations on such important questions as lowering the steam reactivity coefficient and creating a fast-acting emergency safety system.

Those recommendations began to be implemented after more than 10 years, that is, after the Chernobyl disaster.

I will go on. In 1983, when our reactor at Chernobyl was loaded with fuel, physical measurements were made of the characteristics of the active zone, and an extremely dangerous phenomenon was observed—during the first five seconds, the downward movement of the emergency safety rods produced in the reactor not negative, but positive reactivity. But the commission for the physical startup deemed it possible, utterly without grounds, to allow the reactor to be operated. The inspector from Gosatomenergondzor [State Agency for Surveillance of Nuclear Power Facilities] agreed with the commission. To be sure, the scientific director, understanding the danger of this, wrote a letter to the principal designer about the need to eliminate the defect. The designer was working on a technical assignment until December 1984 and...that is where the matter ended.

It took a disaster for this issue to finally be taken seriously and for people to begin to change the rods in the reactor!

And another staggering fact. V.P. Volkov, who headed the team for reliability and safety of nuclear power plants with the RBMK reactors in the laboratory of the Institute imeni Kurchatov, repeatedly issued memoranda to all his managers making the case that the reactor was dangerous and issuing recommendations for its improvement. No one paid any attention to them. In the end,



A.P. Volkov had to turn to that same A.P. Aleksandrov, the president of the academy. But, alas, his memorandum was not lying there in the office of the president of the USSR Academy of Sciences when the accident took place. When the tragedy occurred, Volkov turned over all the material to the USSR Procurator's Office. After that, they no longer allowed him into the institute. Then, in the search for the truth he wrote to M.S. Gorbachev through the staff of the CPSU Central Committee sent A.P. Volkov's material on to Gosatomenerg nadzor. They created a commission which in fact acknowledged that the specialist was right.

...where there was in fact an improbable coincidence of coincident negligence!

...presented A.P. Aleksandrov, member of the academy and scientific director of the project to design the reactor and N.A. Dolellezal, member of the academy and chief designer, from improving the reactor after the accident at the Leningrad AES, after the results of the accident tests at Chernobyl, and after the serious warnings of A.P. Volkov. This would have been done in time—the accident would not have occurred. So who are the true culprits? We or they?

...part, incidentally, the evidence of the guilt of the reactor designers was set aside for a separate case. No one knows how it came out. How can this be?

[KOMSOMOLSKOYE ZNAMYA] Rumor has it (there have been no official announcements) that the case of the designers was halted because it had no judicial significance. You see they were covered by the amnesty law connected with the 70th Anniversary of the Great Victory. Although we are speaking now about the Chernobyl disaster. The truth about the real causes of the accident, as we have understood you correctly, still has not been updated this day. Why not, what do you think?

...Because those who are really to blame for the accident are firmly bound by the general lie. Sometimes it is so difficult that you are simply amazed that people do not say it out. How many times, for example, has there been mention about the failure to study the question of the influence of small doses of radiation on health? And this is being said in a country where for decades thousands of people have been working with radioactive materials and they need only to take the medical cards, learn data on pollution by years, and construct elementary mathematical functions to learn the answer to that question.

...from Chernobyl is being disseminated by public means to those regulations runs into the millions. Here is another example. Krivomazov, PRAVDA correspondent, quoted the chairman of the government commission to investigate the tragedy in Ufa as follows: "We say that at Chernobyl there were four entire systems for protection against a fool, and they were smart people. Turned all four." Can it really have been just

like that? If only people would think before they speak! What does he think we are—suicides, to turn off the protection?

The truth is that the RBMK-1000 reactor in 1986 did not have a single so-called "foolproof" protective system. I wrote about this to the newspaper PRAVDA, but I never received an answer.... The body of the CPSU Central Committee, like Caesar's wife, always ends up above suspicion. And this is not an isolated case. L.A. Buldakov, member of the academy, asserts in the pages of the magazine SMENA (No 24 for last year) that the evacuation of the population of Prip'yat was not tardy, but was timely. How can one speak of timeliness when by noon on the 26th it could not have been clearer that people should not be living in Prip'yat? A member of the academy cannot fail to understand that. Why does he say something he knows to be untrue?

I would like to emphasize: L.A. Buldakov is a medical man, he bears no direct responsibility for the accident. Now just imagine what is being said by people with the same kind of ethics who are directly responsible for the disaster, people like Anatoliy Petrovich Aleksandrov, member of the academy. From the very outset of the events and up until the present year (I am judging from a recent issue of OGONEK), he has been asserting the responsibility of the operating personnel.

Let us put our heads together. If the official version is valid as to the causes of the disaster, then why was all the information about the accident declared secret? Journalists, we suppose, could as a matter of fact get things confused. But the specialists working at AES's ought to know everything about the disaster so as not to make similar mistakes. But not a word has been said to them because these people would immediately figure out how reliable Aleksandrov's reactor really is.

[KOMSOMOLSKOYE ZNAMYA] Fine, but still no one has deprived you or the other specialists of the right to vote in the court.

[Dyatlov] Right. I did not intend to keep silent. That is why the record of the trial, as I have already said, completely proves our innocence.

The forensic experts made the argument about the reliability of the reactors that at the moment of the accident those reactors had already operated about 100 reactor-years (in actuality, only 87). It sounds convincing at first. But just take a pencil. If we divide the 87 reactor-years by the 13 RBMK-1000 reactors in the country, it turns out that we must have what we had at Chernobyl every five or six years. Does anybody want that? Of course not. What is more, N.A. Dolellezal himself, member of the academy, has contributed an eloquent admission to the case. I allow myself to quote him.

"In operation with two-percent uranium enrichment, the influence of the steam effect and the reactivity is regulated by the arrangement of the channels containing the

special control rods, which is strictly provided for in the operating instructions. It is impermissible to do without them because it makes the reactor uncontrollable."

Our reactor did not have additional control rods in the active zone. It follows that sooner or later it had to explode—on the admission of the chief designer himself!

Dolellezal, incidentally, is the only one of the specialists involved with reactors who has told the truth. As you see, he himself has admitted that the reactor that was at Chernobyl was uncontrollable, and the emergency safety system had not been properly designed. Aleksandrov, on the other hand, is still putting all the blame on the operating personnel and does not acknowledge anything.

Just remember: The disaster began when the emergency safety button was pressed. I would like to explain: This button is used for ordinary shutdown of the reactor under normal conditions. So, on 26 April 1986, we pressed the button under ordinary conditions envisaged by all the instructions in order to smother the reaction. Instead there was an explosion.

How is anything like that possible—the emergency safety system does not shut down the reactor, it causes it to explode? There can be only one answer—that is how it was designed. Taking into account everything that has been said, I want to state it plainly. The builders, the assemblers, the manufacturers of the equipment, and the personnel of the power plant were completely innocent in the disaster at the Chernobyl AES. The physicists and the designers must take full responsibility for it.

[KOMSOMOLSKOYE ZNAMYA] The accident was a great tragedy. As in any tragedy, there are those to blame and the rescuers. What do you say about the firemen? There are people who say that their death was all but in vain.

[Dyatlov] Perhaps, I do not know what instructions they violated. But I am firmly convinced that on 26 April the firemen saved us from a global catastrophe. If the fires that had started and which they put out had developed into a large fire and spread to the other generating units operating at nominal speed, then the scale of the tragedy would have been incomparably greater. As for the death of the firemen, there is one caveat. Even if they had been wearing special clothing, this would not have saved them from the gamma radiation. Those firemen who put out the fires on the roof from the scattered burning fuel are unquestionably heroes. Only the existence of an automatic sprinkler system could have saved them from death. But there was none on the roof. That is why we must bow to the shining memory of those courageous men.

[KOMSOMOLSKOYE ZNAMYA] We understand your desire to shed light on the true causes of the disaster. But now let us speak about something else. The reactor was destroyed, radioactive pollution of the locality was rising. What personal responsibility for the effect on

human beings is borne in your view by the plant's specialists? Specifically by Viktor Petrovich Bryukhanov, plant director?

[Dyatlov] It is difficult for me to make a judgment about others. I see Bryukhanov's guilt in that he sent to Kiev on the first day a report on the radiation situation with patently understated figures. But I do not suppose that that document could have influenced the decisions made later. The readings were taken regularly, and the powers that be should have made appropriate decisions on the basis of them. Bryukhanov, incidentally, was not responsible for the civil defense of the city, but only that of the plant. The decision should have been made by Vladimir Pavlovich Voloshko, civil defense chief in Pripyat and chairman of the gorispolkom [city soviet executive committee]. It might, of course, be said that at that time Bryukhanov should have pounded his fist on the table or something like that, and insisted on evacuation.

[KOMSOMOLSKOYE ZNAMYA] The indecisiveness at that critical moment does, of course, deserve condemnation. But in discussing this we are straying from the topic of our conversation in the realm of ethics. We would like to know exactly how the charge against you in the court verdict was stated.

[Dyatlov] This is what the verdict said: "Flagrant violations of the rules set down for guaranteeing nuclear safety at a POTENTIALLY EXPLOSIVE-PRONE ENTERPRISE were the main causes that resulted in the accident." That accounts for Article 220 of the UkSSR Criminal Code, which was the basis for sentencing me to 10 years in jail. But nuclear power plants have never been considered explosive-prone enterprises as is the case, say, with powder plants! If nuclear power plants are in fact explosive-prone, then they need to be designed and built quite differently. What utter nonsense! Before the trial, I knew that I was working at an ordinary plant, and only in the trial did I suddenly learn that it was potentially explosive-prone!

Everyone is aware of the absurdity of such a charge. The court might have easily learned that the reactor never would have exploded if it met the requirements of the normative documents adopted in the country for the safety of nuclear power plants.

[KOMSOMOLSKOYE ZNAMYA] That is clear. But in the eyes of the public, you appear to be a man who undertook some absurd experiment on a full-scale reactor that was in operation. Please tell us about the nature of the experiment.

[Dyatlov] Gennadiy Petrovich Metlenko, representative of "Dontekhenergo," and I were the authors of the program of the experiment. Even before that, he had taken part in tests of many electrical systems at the plant. The essence of the idea came down to using the kinetic energy stored in the spinning rotor of the turbogenerator while it was shut down.

In each of the station's generating units, there is a system for emergency reactor cooling. It is supposed to prevent meltdown of the active zone in a hypothetical situation—the maximum accident envisaged in the design. Rupture of a large-diameter pipe in the first loop is taken to be such an accident. So, when the maximum design accident occurs, current is shut off in the power supply system, and the generator continues to operate the feed pumps at an ever diminishing speed. And thus it must provide the supply of water to the reactor until the system for emergency long-term cooling is turned on. And we intended to conduct a test in order to find out whether the generator operated long enough to perform that operation.

The program of the experiment was written and approved. After the disaster, it was thoroughly analyzed by a great number of specialists, and no one found any mistakes. It is true that they all said that safety measures were not worked out in our program. That is true. But they were performed even before this experiment began and they were noted down in other parts of the program. So it turns out that I am guilty for not having copied the list of those measures from one section to the other!

No one wants to pay attention to the absurdity of such a charge. The expert witnesses have written: according to the instruction, a representative of the nuclear safety office should have been summoned for starting the main circulating pump. They simply did not read the entire instruction to which they were referring. It states there that this is not to be done "without special order." And that order was given....

[KOMSOMOLSKOYE ZNAMYA] You constantly mention the expert witnesses. As far as we understand, it was on them that the court's decision directly depended. What kind of people were they?

[Dyatlov] The overwhelming majority of the experts were representatives of those same design and planning organizations that have a direct interest in preserving the honor of the uniform of their "firms." It is amoral to permit them to make a forensic analysis of the causes of the disaster. The conclusions of the experts hardly ever stand up to criticism. The program of the experiment, for instance, had been checked by many specialists, and it is invalid to say that it was incompetently written. That is the first thing. Second. They say that the program was not cleared with supervisory agencies. Yes, that is true, but the instructions in effect at the time did not call for that. And finally, third. It is obvious that the disaster could have occurred even in any other operation with such a reactor. That is not my opinion alone. I will refer just to the conclusions of the commission of Gennadiy Aleksandrovich Shashanin, deputy minister of power, who wrote a supplement to the official record of the inquiry back in May 1986. Why did the court not take this fact into account? The answer to that question is obvious. Because it had to lead public opinion away

from the true causes of the accident, to obscure the matter, to conceal the names of those who were really to blame.

There has been a particularly large amount of speculation over the question of shutting off the emergency reactor cooling system during the experiment. Nonspecialists are perplexed: How is it that an accident occurred, and the reactor emergency cooling system was turned off? That is an outrage! Not everyone knows that the instructions permitted that system to be turned off for the time allowed by the plant's chief engineer. And it was he who approved the program. I will go further. The emergency system was not designed for such a case. Even if it had been turned on, it would not have managed to begin to operate. And, most important, it does not seem that it could have helped. The reactor was completely destroyed by the explosion, the reactor channels were ruptured, the fuel had been turned to dust. There was no longer anything to cool.

[KOMSOMOLSKOYE ZNAMYA] Do not be offended, but we must ask you: So those who in actuality were convicted for the accident are criminals or victims of the disaster?

[Dyatlov] We are unquestionably victims. The personnel in the unit were the first to take the fatal blow of radiation. And those who recovered also had to take the shame of the judicial inquiry and the monstrous injustice of public condemnation. Those who wield the power in our country always have "switchmen" at hand....

Only death rescued my comrades from shame: Sasha Akimov, shift chief in the unit, Lenya Toptunov, reactor operator, and Valera Perevozchenko, shift chief in the reactor shop. It is scandalous that the cynicism of our bureaucratic machine knows no bounds. The USSR Procurator's Office hit upon the idea of sending documents to the families of Toptunov, Perevozchenko, and Akimov to the effect that they were relieved of judicial accountability "because of their death." Be aware, it said, that your deceased sons, fathers, and husbands are criminals.

To be fair, it should be said that now the truth about what happened at Chernobyl is nevertheless making its way. There are sensational documents, but for the present they are known to practically no one, such as the report of A.A. Yadrichinskiy, inspector of Gospromatomenergonadzor, the report of Prof. B.G. Dubovskiy, the conclusions of the commission chaired by N.A. Shteynberg, and a host of other documents. They offer a competent analysis of the true causes of the disaster, and our innocence has been practically proven. These documents have not been made secret, they can be read in the Commission for Investigation of the Causes of the Accident at the Chernobyl AES of the USSR Supreme Soviet. Why is no one writing about them now?

I attach all hopes of justice to the work of that commission.

[KOMSOMOLSKOYE ZNAMYA] Anatoliy Stepanovich, how do you intend to live after this?

[Dyatlov] My only task is to make the truth about the causes of the disaster public, to rescue from shame at least the memory of my comrades who were killed. I have no other personal plans now, nor can I have. I received 550 rems during the accident, and in addition approximately 100 rems during my previous work. My skin has been burned by radiation. I am now in disability group two. My life is coming to an end. That is why I think day and night of only one thing, I want only one thing—the truth and nothing but the truth.

### **Chernobyl Cleanup Workers From Internal Affairs Ministry Form Association**

91WN0438A Kiev *PRAVDA UKRAINY* in Russian  
18 Apr 91 p 4

[Article by Vadim Feldman: "Baptised by the Atom...."]

[Text] An association of staff members from the Ukrainian SSR Internal Affairs organs has been founded. It consists of those persons who have participated in eliminating the consequences of the accident at the Chernobyl AES [nuclear electric power station].

This new public organization, as well as its goals and tasks, was reported on at a briefing which was held in the Ukrainian Ministry of Internal Affairs after the constituent conference had been completed. The delegates to this conference represented those persons who have worked to eliminate the consequences of the catastrophe at the Chernobyl AES; they are from all the UVD's [Internal Affairs Administrations] of the Ukrainian oblasts and the city of Kiev.

"We now have about 33,000 such persons," said the Ukrainian SSR deputy minister of foreign affairs, Police Major General V.M. Korneychuk, who was elected chairman of the association. "Among them are the firemen who were the first to go in to battle the fire at Bloc No. 4; they did not allow the flames to spread, and by this action they prevented a more terrible tragedy from occurring. Our association also includes their colleagues who, day after day, supplied water for the concrete work, and who pumped out other water—radioactive water—from the drum [?] of the sub-reactor section. It likewise encompasses the following: the personnel of the duty details and patrols, who maintained order on the approaches to the AES, in the city of Pripyat and its environs, the staff members of the BKhSS [Combating the Embezzlement of Socialist Property and Speculation], who safeguarded the monetary funds and valuables of the enterprises, organizations, and farms situated within the zone from which people were being resettled, those who participated in evacuating the population from the contaminated areas and in deactivating the territory of the station itself, medical personnel, who were sent into the zone from all the preventive-treatment institutions of the Ukrainian SSR Ministry of Internal Affairs and the oblast-level UVD's, staff members of the

inquiry-and-information service, who registered the evacuees and helped people to search for and find relatives who had been lost, inspectors of the GAI [State Motor-Vehicle Inspectorate], who were on duty beginning with the very first hours after the accident on highways and guardposts, as well as those persons on duty at the dosimetric, health-monitoring centers. Furthermore, even now police staff members are also working within the 30-kilometer zone."

By the way, Association Chairman V.M. Korneychuk knows—and not just by hearsay—about the events that happened five years ago. At that time Vladimir Mikhaylovich [Korneychuk] was chief of the Kiev Oblast UVD, and on 26 April 1986 he had already arrived at the accident site by 0415 hours.

The association unites not only the staff members of those organs, subdivisions, and services which have participated in various stages of the struggle against the Chernobyl disaster, along with members of their families, but also the families and parents of those persons who perished there or who have died because of exposure to radioactivity. Operating under the motto of "Humanism and Mercy," this association will render to the eliminators and their families material, financial, medical, social, day-to-day, and other assistance, accumulate and systematize information concerning those helped by these measures and those who have suffered from the effects of radiation. They will also ensure that monitoring controls will continue to be exercised on their medical service and care. Because, after all, 3,200 staff members of the Ukraine's internal affairs organs have received a dose of radiation exceeding 25 REMs [Roentgen Equivalent Man], whereas acute radiation sickness has been set at 72 REMs. Among those persons working in the zone of radioactive contamination there has been a tripling in the number of oncological, i.e., cancer-type, illness, and increases by a factor of 1.5-2 in diseases of the stomach and intestinal tract, cardiovascular and endocrine systems, and the incidence of injuries has increased. Approximately 7,000 persons have now been registered as having diseases connected, in one way or another, with the consequences of the Chernobyl accident.

The chief of the Ukrainian SSR Ministry of Internal Affairs Medical Administration, Internal Service Lieutenant Colonel O.V. Petrash told us that, whereas previously the eliminators could obtain a conclusion concerning health disorders only in the republic-level expert council under the Ukrainian Ministry of Internal Affairs, nowadays an additional 11 territorial expert councils have been formed for them. These councils have analogous functions and rights and are located in Dnepropetrovsk, Donetsk, Zhitomir, Lugansk, Lvov, Rovno, Kharkov, Kherson, and Cherkassy Oblasts, as well as in the Crimea, and in the city of Kiev. The operational zone of such councils is also being extended to the adjacent oblasts.



### Ukrainian Official on Chernobyl Victim Resettlement

91W.N0438B Kiev PRAVDA UKRAINY in Russian  
12 Apr 91 p 2

[Interview with Georgiy Aleksandrovich Gotovchits, chairman, Ukrainian SSR State Committee for Protecting the Population from the Consequences of the Accident at the Chernobyl AES, by Aleksandr Sokol, correspondent: "By the Whole World"]

[Text] The Chernobyl accident was an unprecedented ecological disaster which affected not only the Ukraine, but also Belorussia and Russia. At the end of last year a State Committee for protecting the population from this disaster was set up in this republic. Its principal concern nowadays is resettling people from areas having radiation contamination. This work and its scope comprise the topic of our correspondent's interview with G.A. GOTOVCHITS—chairman of the Ukrainian SSR State Committee for Protecting the Population from the Consequences of the Accident at the Chernobyl AES [nuclear electric power station].

[Sokol] Georgiy Aleksandrovich, to what extent will the problems of resettling people from the areas which have suffered be solved during the present year?

[Gotovchits] As we have studied and evaluated the radiation situation and accumulated the necessary scientific and practical data, we have come to the conclusion that small doses of radiation change the socioeconomic conditions of people's lives. Therefore, a decision has been adopted to revise the criteria for resettlement. As you know, last year it was carried out in places where the level of soil contamination by cesium exceeded 40 Curie units per square kilometer. This year we are resettling people if the contamination is 15 Curie units or higher.

[Sokol] How many people will be resettled, and who are they—city people or rural inhabitants? And from what regions will they come?

[Gotovchits] As to the regions, they are primarily the most contaminated ones—Kiev and Zhitomir Oblasts; the principal mass of people will come from here. They will be joined by certain villages of the Chernigov region and the northern portion of the Rovno area. These are new regions from which people will be resettled.

During the course of the present year we plan to resettle 66 population centers. Some 17,000 families live in them, which amounts to approximately 35,000 persons. For the sake of comparison, let me say that last year we resettled 12,000. The work has become extremely complicated. The builders must utilize some 1.5 billion rubles. This total amount speaks for itself.

[Sokol] From what budget will the money come?

[Gotovchits] From the Union budget. On that score we foresee no particular needs or difficulties. The complications lie elsewhere—in the area of material resources.

[Sokol] At high-level conferences people have been uttering calm, reassuring noises such as the following: The Chernobyl matter will be handled by a special separate line item in the national economic plan—everything will be taken care of. Is there already such a line item?

[Gotovchits] There is a line item, but, as you yourself know, the situation is such that there are some deficits and shortages. Many problems have become more acute than they used to be. For example, we have to obtain lumber primarily from outside this republic, and this is now the problems of problems. Furthermore, the situation is not much better with regard to local materials. We are short of vehicles, machines, and mechanisms. All this complicates our work. Nevertheless, we have to build—there's just no other solution.

[Sokol] In former years many persons attempted to remain in their own localities, in their own oblasts. How do matters stand now in this regard?

[Gotovchits] In most cases that's the way it still is. It's hard for a "field-dweller" to live, let's say, in a steppe zone; he does not want to leave his Polesye. But some people have wished to leave. This applies, in particular, to the Kharkov and Kirovograd regions.

By the way, it is also a matter of some importance for the oblasts where these people being resettled finally do settle down; housing must be built in these localities. Let's say housing has to be built in the Zhitomir region for some people from Kherson—it's a burdensome matter. Furthermore, there's a need for apartments in their own home area. Therefore, many persons are attempting to take the resettlers into their own homes. But the final decision is up to the people being resettled.

[Sokol] Letters now coming into PRAVDA UKRAINY suggest that regions be resettled which have a shortage of manpower. Such regions would include the South and health-resort areas. Should such suggestions be dismissed out of hand?

[Gotovchits] Certainly not. People should have the opportunity to make any a choice. The only thing required for such a step is a common or general agreement.

Misunderstandings arise, it seems to me, from the fact that the persons doing the inviting usually do not invite but rather impose their own decision or solution. If, however, people met together and looked over the entire locality, they would quickly come to a decision.

[Sokol] Construction is carried on just as it used to be—an oblast receives an assigned task and proceeds to the construction site with its own people, equipment, building materials, and even its own policemen. Isn't that so?

[Gotovchits] Yes, it's the same approach as before. The oblasts' collectives proceed to the construction sites with their own equipment and materials; they set up and

arrange their own everyday life, rest, and recreation. They have their own cooks, physicians, and guardians of law and order.

As you can understand, this measure is obligatory. It complicates the process and makes it more expensive. But it does allow maximum use to be made of the local potential and a combination of the efforts of various construction organizations—state, kolkhoz, cooperative, and individual enterprises. As a result, we are solving the principal problem—to erect houses at an accelerated rate and in huge quantities.

[Sokol] At the conference in this republic's Council of Ministers which took place in January it was noted that certain oblasts are, most deplorably, attempting to get out of building houses for the victims of Chernobyl. Has all this been specified in the present plan?

[Gotovchits] Not completely. Whereas agreement has virtually been attained with Kharkov and Sumy Oblasts, not everything has been fully cleared up in the case of Dnepropetrovsk and Zaporozhye Oblasts. They have accepted their assigned tasks but have not yet come up with their lists of organizations which are to carry them out. This disturbs us—time is running out.

There are unsolved problems in the Volyniya region. There are also rayons contaminated by radiation here. But the Volynians ought to help those persons who are living under even worse conditions.

[Sokol] Are some kinds of operations already being carried out directly at the construction projects?

[Gotovchits] Yes. Service cars [?] have already been set up, the building lots are being staked out, and a number of oblasts are finishing up their preparation. But getting fully underway, as the saying goes, still lies ahead of us. Nor have we avoided delays. They have occurred for various reasons. Things have been affected, for example, by the cold weather: February turned out to have an unusually large amount of freezing temperatures. A number of settlements do not yet have full sets of completed documentation. There has been no great haste with regard to investigatory or surveying operations: an attempt has been made to avoid the mistakes of past years.

[Sokol] Do you have in mind the case of the settlement planned to be built "over radon" being moved?

[Gotovchits] Not only that. It happened, you know, that these people had been resettled from a "contaminated" place to one that was less "contaminated." Such cases cannot be allowed to occur. Therefore, in addition to Ukrgidromet [Ukrainian Hydrometeorological Bureau] and the Ministry of Health, the staff members of the Ukrainian SSR Academy of Sciences and those of the Nuclear Research Institute have also been involved in studying sites. Several building lots have had to be changed because of radon—a substantial source of radiation—or because of an insufficient reserve supply of

drinking water. Extremely careful studies have had an effect on the sources of planning.

[Sokol] Georgiy Aleksandrovich, the following point has been emphasized from the rostrum: "During the year 1991 we shall absorb and utilize 1.5 billion rubles!" The volume is colossal. And all these operations are supplementary, i.e., in addition to the "regular" construction work. Is this task realistic?

[Gotovchits] The program is an extremely difficult one. Speaking frankly, unless our attitude towards it changes, and if the dawdling and delays which I spoke about continues, we will not achieve success.

We must take the situation into account—it is simply impossible to postpone construction any further. We must do as much as possible.

[Sokol] I don't like to remind you about the unpleasant past, but the fact of the matter is that the plan for 1990 fell short.

[Gotovchits] The task assigned for last year did, indeed, remain unfulfilled. More than 300 farmsteads and a considerable number of apartments in multistory apartment houses were shifted or carried over, as they say, to this year. For the most part, they were well-constructed, but they have not yet solved the problems of water supply and heating. We have also been delayed by the "traditional" poor quality of finishing operations. Work on these incomplete projects is being finished up, and all the planned housing will be put into operation.

This, as people say, is an assumed, usual type of problem. But an unanticipated problem has also arisen. The already erected houses remain vacant. There are significantly more of them than those that remain unfinished. For various reasons people are not moving into them. The principal reason is as follows. In the regions being monitored for radiation people receive monetary bonuses, here they are provided—at least to a certain extent—with foodstuffs, attention to their health, and health care for their children. In the "clean zone" there is none of this. Moreover, there are difficulties with job placement, not enough schools, kindergartens, and poor services, these facilities will be built later. And so many persons are in no great hurry to move to the new settlements.

[Sokol] In that case, is it feasible to have such an extensive construction program for this year?

[Gotovchits] It is feasible. During the present year the situation must change. The Chernobyl laws, which were passed at the end of February by this republic's Supreme Soviet, guarantee the victims social protection regardless of where they live.

The vacant farmsteads and apartments must be occupied and lived in. I'd like to hope that those persons being resettled will understand the situation.

[Sokol] In contrast to the Union plan, the Ukraine has decided to shorten the time period for resettlement by a year. As I understand it, during the present year this portion of the work will be completed. Is that correct?

[Gotovchits] Yes. But from those territories where the contamination amounts to 15 Curie units or higher per square kilometer. And on condition that the outlined program will be fully carried out. The following circumstance must also be borne in mind. The concept of safe residential living, as adopted by this republic's Supreme Soviet, assumes supplementary criteria for resettlement such as, in particular, the impossibility of producing "clean" farm produce, the condition of health of children with irradiated thyroid glands.... And so, the number of persons being resettled is growing. To what extent, I still cannot say, but there will be an increase. These families will move next year. But the decisive step will take place during the present year.

#### **Ukrainian SSR Law on Territory Contaminated by Chernobyl**

91UN0406A Kiev PRAVDA UKRAINY in Russian  
22 Mar 91 pp 1, 3

[UkSSR Law on the Ukrainian Soviet Socialist Republic on the Legal Regulations for Territories Subject to Radioactive Contamination as a Result of the Chernobyl Catastrophe"]

[Text] The Chernobyl catastrophe created an exceptionally dangerous radiation situation in terms of human health and the environment, spread over a significant area of the UkSSR. The Republic was declared a zone of ecological catastrophe. The elimination of the consequences of this catastrophe depends on the legislative determination of the legal system to be applied in the territories with different degrees of radioactive contamination, and the measures to ensure its implementation. The law regulates matters pertaining to the classification of territories into respective zones and the system for their use and protection and for the conditions under which the population can live and work and for engaging in economic, scientific-research, and other activities on such territories. The law secures and guarantees the implementation of the system for the utilization and protection of said territories, with a view to reducing the effect of radioactivity on human health and on ecological systems.

#### **Section I**

##### **General Stipulations**

#### **Article 1. Defining Territories Subject to Radioactive Contamination as a Result of the Chernobyl Catastrophe**

Within the UkSSR, such territories include those in which durable contamination of the environment with radioactive substances has occurred as a result of the Chernobyl catastrophe, in excess of the pre-accident level; taking into consideration the natural-climatic and

comprehensive ecological features of the specific territories, this could lead to a radiation of the population in excess of 1.0 millisievert (0.1 rem) annually, requiring that steps be taken to ensure the protection of the population from radiation and other particular interventions aimed at limiting any additional irradiation of the population, caused by the Chernobyl catastrophe, and ensuring the population's pursuit of normal economic activities.

#### **Article 2. Defining the Categories of Zones of Radioactively Contaminated Territories**

Depending on the landscape and geochemical features of the soil, the extent increase in the natural pre-accident level of accumulation of radionuclides in the environment and related degrees of possible adverse effect on the health of the population, the requirements related to providing radiation protection to the population and to taking other special measures, the territory subject of radioactive pollution as a result of the Chernobyl catastrophe is classified into several zones.

These zones are the following:

1. Zone of condemnation: a territory from which the population was evacuated in 1986.

2. Zone of unconditional (mandatory) resettlement of the population: a territory subject to intensive contamination with long-life radionuclides, with a compact pollution of the soil with cesium isotopes of 15.0 Ci/km<sup>2</sup> or higher, strontium of 3.0 Ci/km<sup>2</sup> or higher or plutonium 0.1 Ci/km<sup>2</sup> or higher, as well as territories with soils which contribute to the high migration of radionuclides in plants, with a density of isotope pollution of cesium between 5.0 and 15.0 Ci/km<sup>2</sup>, strontium from 0.15 to 3.0 Ci/km<sup>2</sup>, or plutonium from 0.01 to 0.1 Ci/km<sup>2</sup>, in which the effective equivalent dose of human radiation may exceed 5.0 millisievert (0.5 rem) per year above the dose which the person received in the pre-accident period.

3. Zone of guaranteed voluntary resettlement: a territory showing a soil pollution density with isotopes of cesium from 5.0 to 15.0 Ci/km<sup>2</sup>, strontium from 0.15 to 3.0 Ci/km<sup>2</sup>, or plutonium from 0.01 to 0.1 Ci/km<sup>2</sup>, as well as territories with soils which contribute to the high migration of radionuclides in plants with a density of contamination with isotopes of cesium from 1.0 to 5.0 Ci/km<sup>2</sup>, strontium from 0.02 to 0.15 Ci/km<sup>2</sup> or plutonium from 0.005 to 0.01 Ci/km<sup>2</sup> in which the effective equivalent dose of human radiation may exceed 1.0 millisievert (0.1 rem) per year above the dose which the person received in the pre-accident period.

4. Zone of increased radio-ecological control: a territory with a pollution density of the soil with cesium isotopes from 1.0 to 5.0 Ci/km<sup>2</sup>, strontium 0.02 to 0.15 Ci/km<sup>2</sup> or plutonium from 0.005 to 0.01 Ci/km<sup>2</sup> and territory with soils contributing to the high migration of radionuclides in plants, with a pollution density of cesium from 0.2 to 1.0 Ci/km<sup>2</sup>, in which the effective equivalent dose of radiation of a person must not exceed 1.0 millisievert

(0.1 rem) per year above the dose to which he was exposed in the pre-accident period.

Additional criteria on the contamination of the soil with radionuclides may be set by the National Commission for the Radiation Protection of the Ukrainian Population.

In determining the level of soil contamination with radionuclides for purposes of zone demarcation categories, a 90-percent indicator is set on the basis of the overall number of measurements of the density of contamination, on an ascending scale.

The boundaries of these zones are set and reviewed by the UkSSR Council of Ministers, on the basis of the expert conclusions of the National Commission for the Radiation Protection of the Ukrainian Population, the UkSSR Academy of Sciences, the UkSSR Ministry of Health, the UkSSR State Committee for the Protection of the Population From the Consequences of the Chernobyl AES [nuclear electric power station] Accident, the Ukrainian Republic Hydrometeorological Administration, the UkSSR State Agroindustrial Committee, and the UkSSR State Committee for Ecology and Rational Utilization of Nature, on the presentation of the oblast soviets of people's deputies.

The maps of said zones and the list of settlements included in such zones will be published in the republic and local press.

#### **Article 3. Determining Radiation Hazardous Land**

Radiationally hazardous land is land on which any further life of the population and the possibility of producing agricultural or other goods, and nutritional substances, consistent with Republic and internationally admissible levels of radioactive substances, or goods the use of which would be inexpedient due to ecological conditions, have become impossible.

Such land must be removed from agricultural use. The land included in this article pertains to territories indicated in points 1 and 2 of Article 2 of this law.

#### **Article 4. Determining Radioactively Contaminated Land**

Radioactively contaminated land is land which requires taking measures for radiation protection and other special intervention, aimed at limiting any additional radiation caused by the Chernobyl catastrophe and ensuring normal economic activities.

The land referred to in this article includes the territories listed in points 3 and 4, Article 2, of this law.

#### **Article 5. Jurisdiction of the UkSSR Concerning Zones Subject to Radioactive Contamination As a Result of the Chernobyl Catastrophe**

In accordance with the Declaration on Ukrainian State Sovereignty, the UkSSR defines the legal system of the zones, and concludes contracts for work with the state

organs of the USSR, Soviet republics, foreign countries, and international organizations.

The UkSSR Council of Ministers defines all economic and international activities in the condemned zone.

Coordination of the work in the zones is provided by the UkSSR State Committee for the Protection of the Population From the Consequences of the Accident at the Chernobyl AES.

#### **Article 6. Financing Work in Zones Exposed to Radioactive Contamination**

The financing of work to remove the consequences of the Chernobyl catastrophe shall be provided out of funds appropriated in accordance with the State-Ukrainian Republic Program for Eliminating the Consequences of the Chernobyl Catastrophe, including from the Republic's budget, from which the sums contributed to the Union budget will be deducted in the necessary amount, and from other income.

To this effect, the Chernobyl Credit-Financial Bank is being created as part of the banking system of the UkSSR.

The funds will be handled by the UkSSR Council of Ministers. The planning and material and technical procurements and amounts of financing the work will be determined by the UkSSR Council of Ministers based on the presentation of the UkSSR State Committee for the Protection of the Population From the Consequences of the Accident at the Chernobyl AES.

#### **Article 7. Securing Economic Activities in the Zones of Guaranteed Voluntary Resettlement and Intensified Radioecological Control**

State enterprises, organizations, kolkhozes, sovkhozes, and other establishments within the zones of guaranteed voluntary resettlement and increased radioecological control shall be exempt from taxation. In their case, the UkSSR Council of Ministers shall establish privileged conditions for financing and guaranteed material and technical support.

#### **Article 8. Administration of the Condemned Zone**

The administration of the condemned zone shall be provided by the respective subdivision of the UkSSR State Committee for the Protection of the Population From the Consequences of the Accident at the Chernobyl AES—the Zonal Administration.

The Zonal Administration shall organize and coordinate all measures on the territory of the condemned zone to solve problems of their financing, maintenance of public order, and health of personnel working within this territory, safeguard the scientific and economic interests of the Republic, and assume responsibility for authentically, fully, and objectively informing the Republic's population about the ecological situation in the condemned zone.



**Article 9. Administration of the Zones of Unconditional (Mandatory) Resettlement and of Guaranteed Voluntary Resettlement**

The administration of zones of unconditional (mandatory) resettlement and guaranteed voluntary resettlement shall be provided by the respective oblast soviets of people's deputies

**Article 10. Providing the Ukrainian Population With Information on the Radiation Status of Territories**

The UkSSR Council of Ministers will provide the population with the necessary information on the radiation condition of the territories.

**Article 11. Ownership Priority Relative to Information and Results of Scientific Research Related to the Chernobyl Catastrophe**

All scientific information and results of scientific studies obtained in the Chernobyl zone shall be the property of the UkSSR and may be used only by permission of the UkSSR Council of Ministers.

**Section II**

**Legal System in the Zones of Condemnation and Unconditional (Mandatory) Resettlement**

**Article 12. Types of Activities Prohibited in the Zones of Condemnation and Unconditional (Mandatory) Resettlement**

The land in the zones of condemnation and unconditional (mandatory) resettlement shall be withdrawn from economic activities and separated from related territories and classified in the categories of radiationally hazardous lands.

The following is prohibited in the condemnation and unconditional (mandatory) resettlement zones:

Permanent residence by the population;

Engaging in activities resulting in commodity output;

Stay by individuals without a special permission to this effect or hiring for work individuals under the age of 35 without their consent;

Hauling outside the limits of the zones, without the special permission of the UkSSR State Committee for the Protection of the Population From the Consequences of the Accident at the Chernobyl AES of soil, clay, sand, peat, lumber, vegetal feeds, medicinal plants, mushrooms, berries, and other forest by-products, with the exception of samples taken for scientific purposes;

Importing or exporting into and out of the zones construction materials and structures, machines and equipment, household items, and so on, without the special

permission of the UkSSR State Committee for the Protection of the Population From the Consequences of the Accident at the Chernobyl AES and without dosimetric control;

Engaging in farming, forestry, industrial or other activities or construction without special permission;

Grazing cattle, disturbing the habitat of wildlife, and engaging in sports or industrial hunting or fishing activities;

Driving cattle, floating timber, and transit traveling with any type of transportation. Entering or leaving the territory of the zone may be allowed only with special passes with mandatory dosimetric control of people and means of transportation;

Any activity which violates radiation safety regulations

**Article 13. Mandatory Measures Implemented in the Zones of Condemnation and Unconditional (Mandatory) Resettlement**

Mandatory measures are taken by specialized subunits in the zones of condemnation and unconditional (mandatory) resettlement, as follows:

Preventing the removal of radionuclides from the territories of the zone and the radioactive pollution of the environment;

Monitoring the condition of the natural environment and providing medical-biological monitoring;

Maintaining the territory in a suitable sanitary and fire-safety condition;

Use of methods for securing radionuclides in the localities.

All activities must take place with a limited number of recruited individuals and within an overall collective dose

**Article 14. Protection of the Territories of the Zones of Condemnation and Unconditional (Mandatory) Resettlement**

A strict environmental protection system and protection of the territories and of natural, historical, and ethnocultural monuments, in accordance with current legislation, shall be maintained in the zones of condemnation and unconditional (mandatory) resettlement

The maintenance of public order and fire safety on the territory of the zones of condemnation and unconditional (mandatory) resettlement, and the control-permit system in entering or leaving such zones shall be enforced by the specialized organs of the UkSSR Ministry of Internal Affairs.

Control over the implementation of said measures on the territories of the zones of condemnation and unconditional (mandatory) resettlement shall be enforced by the corresponding executive committees of the oblast soviets of people's deputies.

### Section III

#### Legal System in the Zone of Guaranteed Voluntary Resettlement

##### Article 15. Utilization of the Land in the Zones of Guaranteed Voluntary Resettlement

Land in the zone of guaranteed voluntary resettlement shall be classified as radioactively contaminated and used in accordance with the procedure stipulated by the UkSSR Council of Ministers.

If for economic or ecological reasons the further utilization of such land is impossible, it shall be classified as radiation hazardous.

##### Article 16. Types of Activities Prohibited in the Zone of Guaranteed Voluntary Resettlement

The following are prohibited in the zone of guaranteed voluntary resettlement:

Construction of new and expanding operating enterprises not directly related to ensuring the radioecological and social protection of the population and its activities;

Any activity which could worsen the radioecological situation;

The utilization of nature inconsistent with the requirements of radiation safety standards;

Introduction of pesticides, herbicides or toxic chemicals without special permission by the UkSSR Council of Ministers;

Recruiting secondary school and university students for work which could adversely affect the state of their health (based on conclusions by the UkSSR Ministry of Health).

##### Article 17. Measures To Reduce Risk of Population Morbidity in the Zone of Guaranteed Voluntary Resettlement

With a view to lowering the risk of population morbidity and lowering the dose of radiation, the state guarantees:

The voluntary resettlement of people from the zone;

Restructuring production facilities with a view to the production of ecologically clean goods;

Constant dosimetric control of the radioactive contamination of the soil, water, air, food products, raw materials, housing and production premises, and medical-biological and radioecological monitoring;

Comprehensive annual medical outpatient treatment of the population and ensuring early disease prevention;

Supplying the population with the necessary quantity and variety of medical preparations, drinking water, and clean nutritional products, including those with radio-protective properties, which contribute to the elimination of radionuclides from the organism;

If expedient, deactivating the territory by specialized units;

Comprehensive gasification of settlements and the construction of roads with asphalt and concrete lining;

Providing citizens living on said territory with benefits and compensations as stipulated in the UkSSR Law on the Status and Social Protection of Citizens Who Suffered As a Result of the Chernobyl Catastrophe and other current legislation acts.

### Section IV

#### Legal System in the Zone of Intensified Radioecological Control

##### Article 18. Measures To Reduce the Morbidity Risk to the Population in the Zone of Intensified Radioecological Control

With a view to reducing the population morbidity risk and lowering the dose of radiation, the state guarantees:

Restructuring of production facilities for the production of ecologically clean products;

Constant dosimetric control over the radioactive contamination of the soil, water, air, food products, raw materials, housing and production premises, and medical-biological and radioecological monitoring;

Comprehensive annual medical outpatient treatment of the population and ensuring early disease prevention;

Supplying the population with the necessary quantity and variety of medical preparations, drinking water, and clean nutritional products, including those with radio-protective properties, which contribute to the elimination of radionuclides from the organism;

If expedient, deactivating the territory by specialized units;

Gradual comprehensive gasification of settlements and the construction of roads with asphalt and concrete lining;

Providing citizens living on said territory with benefits and compensations as stipulated in the UkSSR Law on the Status and Social Protection of Citizens Who Suffered As a Result of the Chernobyl Catastrophe and other current legislation acts.

**Article 19. Types of Activities Prohibited in the Zone of Intensified Radioecological Control**

The following is prohibited in the zone of intensified radioecological control:

The construction of sanatoriums, Pioneer camps, bases, and rest homes and the building of new and expansion and reconstruction of existing enterprises which have a harmful effect on the health of the population and on the environment;

Any activity which worsens the radioecological situation;

The use of nature inconsistent with the requirements of radiation safety standards;

Introducing pesticides, herbicides or toxic chemicals without the special permission of the UkSSR Council of Ministers;

Recruiting secondary school and university students for types of work which could adversely affect the condition of their health (based on the conclusions of the UkSSR Ministry of Health).

**Section V**

**Control Over the Observance of the Legal System in Zones Subject to Radioactive Contamination as a Result of the Chernobyl Catastrophe**

**Article 20. State Control Over the Observance of the Legal System in Zones Subject to Radioactive Contamination as a Result of the Chernobyl Catastrophe**

State control over the observance of the legal system in zones subject to radioactive contamination is provided by the oblast soviets of people's deputies, their executive organs, and the state organs so authorized by the state, in accordance with the legislation of the UkSSR.

The UkSSR State Committee for the Protection of the Population From the Consequences of the Accident at the Chernobyl AES is the organ responsible for the exercise of state control over the observance of the legal system in the zone of condemnation.

**Article 21. Organs Responsible for Exercising Radiation Control in Zones Subject to Radioactive Contamination as a Result of the Chernobyl Catastrophe**

Control and prognostic evaluation of the total dose of radiation of individuals from all sources under their specific living and working conditions is assigned to the UkSSR Ministry of Health.

The overall assessment of the radiation situation on the territory of the zones subject to radioactive contamination, radioecological monitoring of the territories, and methodical guidance and coordination of the work to determine the radiation situation are assigned to the UkSSR State Committee for the Protection of the Population From the Consequences of the Accident at the Chernobyl AES.

Radiation control of farmland is provided by the UkSSR State Agroindustrial Committee; of forests, regardless of departmental affiliation, by the UkSSR Ministry of Forest Resources; of water resources, by the UkSSR Ministry of Water Resources and Water Economy; ground waters and geological environment, by the Ukrgeologiya Ukrainian Main Coordination-Geological Administration; and the territory of settlements, by the Ukrainian Republic Hydrometeorological Administration.

Radiation control over the level of pollution of agricultural commodities and food products is provided by the UkSSR State Agroindustrial Committee and the UkSSR Ministry of Health.

Radiation control over the levels of pollution of railroad, water, air, and automotive transportation facilities and their structural components, and solving problems of granting permission for moving it outside the zones of condemnation and unconditional (mandatory) resettlement are assigned to the ministries and departments in charge of said transportation facilities, with the participation, in the required cases, of the respective services of the UkSSR Ministry of Internal Affairs.

Granting permission for taking household and consumer items, labor tools, and construction materials outside the limits of the radioactively contaminated territories from which the resettlement of people is planned is assigned to the organs of the state sanitation control and the civil defense staffs; in the case of domestic animals, to the UkSSR State Veterinary Supervision Inspectorate.

Control over the accuracy and objective nature of the data submitted by departmental services in charge of radiation control, regardless of their affiliation, is assigned to the UkSSR state sanitation supervision of the Ministry of Health; metrological control is assigned to the Ukrainian Republic Administration of the USSR Gosstandart.

**Section VI**

**Responsibility for Violations of the Legal System in Zones Subject to Radioactive Contamination as a Result of the Chernobyl Catastrophe**

**Article 22. Responsibility for Violating the Legal System in Zones Subject to Radioactive Contamination**

Individuals guilty of:

Violating the legal system established with this law for zones subject to radioactive contamination and failure to execute the orders of the state organs in charge of control in this area;

Nonfulfillment of the radiation safety measures stipulated in this law;

Concealing, falsifying, lateness in or else incompletely informing the population concerning the radioecological

situation shall entail criminal, administrative, material or any other liability in accordance with the existing legislation.

Citizens, officials, and other individuals by whose fault enterprises, establishments, and organizations have been harmed as a result of engaging in economic or other activities prohibited in the zones of radioactive contamination shall bear criminal, administrative, or material liability as stipulated in the current legislation;

Citizens guilty of the destruction, damaging or moving radiation safety signs or fences in said zones bear criminal, administrative, material or any other liability in accordance with the current legislation.

L. Kravchuk, chairman, UkSSR Supreme Soviet

Kiev, 27 February 1991

#### Resolution of the UkSSR Supreme Soviet

##### **On the Procedure for the Enactment of the UkSSR Law on the Legal System of Territories Subject to Radioactive Contamination as a Result of the Chernobyl Catastrophe**

The Supreme Soviet of the Ukrainian Socialist Soviet Republic resolves:

1. The enactment of the UkSSR Law on the Legal System in Territories Subject to Radioactive Contamination As a Result of the Chernobyl Catastrophe, as of 1 July 1991

2. Assigns to the UkSSR Council of Ministers:

To formulate a mechanism for the promulgation of the law and to take immediate measures for its implementation.

To report on the course of the implementation of said resolution to the UkSSR Supreme Soviet in May 1991

3. Control over the implementation of the present resolution is assigned to the UkSSR Supreme Soviet Commission for Problems of the Chernobyl Catastrophe.

L. Kravchuk, chairman, UkSSR Supreme Soviet.

Kiev, 28 February 1991

##### **UkSSR Law on Status of Citizens Affected by Chernobyl**

91WN0407A Kiev PRAVDA UKRAINY in Russian  
28 Mar 91 pp 2-4

[Law signed by L. Kravchuk, UkSSR Supreme Soviet chairman, Kiev, 28 February 1991: "On the Status and Social Protection of Citizens Affected by the Chernobyl Catastrophe"]

[Text] The Chernobyl catastrophe affected the lives of millions of people. In many areas and over huge territories new social and economic conditions appeared. The Ukraine was proclaimed a zone of ecological disaster.

The establishment of a system for the reliable protection of the people from the consequences of the Chernobyl catastrophe demands that significant financial, material and scientific resources be obtained.

#### Section I

##### **General Regulations**

##### **Article 1. Objective and Basic Tasks of the Law**

The objective of this law is to protect the citizens who suffered as a result of the Chernobyl catastrophe and to solve problems of medical and social nature, which arose as a result of the radioactive contamination of the territory.

##### **Article 2. Defining the Categories of Zones of Radioactively Contaminated Territories**

Depending on the landscape and geochemical features of the soil, the extent increase in the natural pre-accident level of accumulation of radionuclides in the environment and related degrees of possible adverse effect on the health of the population, the requirements related to providing radiation protection to the population and to taking other special measures, the territory subject of radioactive pollution as a result of the Chernobyl catastrophe is classified into several zones.

These zones are the following:

1. Zone of condemnation: a territory from which the population was evacuated in 1986.

2. Zone of unconditional (mandatory) resettlement of the population: a territory subject to intensive contamination with long-life radionuclides, with a compact pollution of the soil with cesium isotopes of 15.0 Ci/km<sup>2</sup> or higher, strontium of 3.0 Ci/km<sup>2</sup> or higher or plutonium 0.1 Ci/km<sup>2</sup> or higher, as well as territories with soils which contribute to the high migration of radionuclides in plants, with a density of isotope pollution of cesium between 5.0 and 15.0 Ci/km<sup>2</sup>, strontium from 0.15 to 3.0 Ci/km<sup>2</sup>, or plutonium from 0.01 to 0.1 Ci/km<sup>2</sup>, in which the effective equivalent dose of human radiation may exceed 5.0 millisievert (0.5 rem) per year above the dose which the person received in the pre-accident period.

3. Zone of guaranteed voluntary resettlement: a territory showing a soil pollution density with isotopes of cesium from 5.0 to 15.0 Ci/km<sup>2</sup>, strontium from 0.15 to 3.0 Ci/km<sup>2</sup>, or plutonium from 0.01 to 0.1 Ci/km<sup>2</sup>, as well as territories with soils which contribute to the high migration of radionuclides in plants with a density of contamination with isotopes of cesium from 1.0 to 5.0 Ci/km<sup>2</sup>, strontium from 0.02 to 0.15 Ci/km<sup>2</sup> or plutonium from 0.005 to 0.01 Ci/km<sup>2</sup> in which the effective equivalent dose of human radiation may exceed 1.0 millisievert (0.1 rem) per year above the dose which the person received in the pre-accident period.

4. Zone of increased radio-ecological control: a territory with a pollution density of the soil with cesium isotopes



from 1.0 to 5.0 Ci/km<sup>2</sup>, strontium 0.02 to 0.15 Ci/km<sup>2</sup> or plutonium from 0.005 to 0.01 Ci/km<sup>2</sup> and territory with soils contributing to the high migration of radionuclides in plants, with a pollution density of cesium from 0.2 to 1.0 Ci/km<sup>2</sup>, in which the effective equivalent dose of radiation of a person must not exceed 1.0 millisievert (0.1 rem) per year above the dose to which he was exposed in the pre-accident period.

Additional criteria on the contamination of the soil with radionuclides may be set by the National Commission for the Radiation Protection of the Ukrainian Population.

In determining the level of soil contamination with radionuclides for purposes of zone demarcation categories, a 90-percent indicator is set on the basis of the overall number of measurements of the density of contamination, on an ascending scale.

The boundaries of these zones are set and reviewed by the UkSSR Council of Ministers, on the basis of the expert conclusions of the National Commission for the Radiation Protection of the Ukrainian Population, the UkSSR Academy of Sciences, the UkSSR Ministry of Health, the UkSSR State Committee for the Protection of the Population From the Consequences of the Chernobyl AES [Nuclear Power Plant] Accident, the Ukrainian Republic Hydrometeorological Administration, the UkSSR State Agroindustrial Committee, and the UkSSR State Committee for Ecology and Rational Utilization of Nature, on the presentation of the oblast soviets of people's deputies.

The maps of said zones and the list of settlements included in such zones will be published in the republic and local press.

#### **Article 3. Conditions for Residence and Labor Activities of the Population Without Restrictions Based on the Radiation Factor**

A condition for the residential and labor activities of the population without restrictions caused by the radiation factor is an additional dose of radioactive isotopes resulting from the contamination of the territory, not to exceed radiation limits of 1.0 millisievert (0.1 rem) per year.

Entering the condemnation and unconditional (mandatory) resettlement zone for purposes of permanent residence is prohibited. The population may live in such zones only until the resettlement has been completed. The procedure for moving to the permanent place of residence in a zone of guaranteed voluntary resettlement shall be defined by a special resolution of the UkSSR Council of Ministers.

Assigning young specialists under the age of 35, after their graduation from higher and secondary specialized institutions, to work in zones of condemnation and unconditional (mandatory) and guaranteed voluntary resettlement without their agreement is prohibited.

#### **Article 4. Right to Resettlement**

In the case of a possible exposure to an additional dose in excess of 1.0 millisievert (0.1 rem) per year, to be determined by the UkSSR Ministry of Health, individuals have the right to resettle with compensations, as stipulated in this law.

The resettlement stages are regulated by the Concept on the Population Residence in the Territory of the UkSSR With Increased Levels of Radiation Contamination As a Result of the Chernobyl Catastrophe.

The right to resettlement from the zone of intensified radioecological control is also granted to pregnant women, families with children under 18 and individuals on the basis of medical indications, as determined by the UkSSR Ministry of Health.

The resettlement procedure is formulated by the UkSSR Council of Ministers.

#### **Article 5. Conditions for Population Re-evacuation**

The re-evacuation of the population must take place exclusively on a voluntary basis, after the radioactive contamination of the territory has been reduced to a level which offers safe conditions to residents without restrictions, in accordance with part of Article 1.

3. A decision on the re-evacuation of the population must be made by the UkSSR Council of Ministers, based on the conclusions of the National Commission for the Radiation Safety of the Ukrainian Population.

#### **Article 6. Quality of Food Products**

Food products in which the content of radionuclides does not exceed the stipulated standards are considered clean and suitable for marketing and consumption.

The production of farm goods the radioactive contamination of which exceeds the established standards is prohibited.

The rates of content of radionuclides in food products and agricultural produce are set by the National Commission for the Radiation Safety of the Ukrainian Population.

Goods produced in the zones of unconditional (mandatory) resettlement and guaranteed voluntary resettlement and intensified radioecological control must have a certificate indicating the place of production, the content of radionuclides, the producer responsible for the commodity and the controller who has tested it for radionuclide content.

Goods contaminated with radionuclides, received for production purposes or marketing through the commercial network must be confiscated and buried or else utilized in accordance with the procedure established by the UkSSR Council of Ministers, with compensation to the state for the outlays paid by individuals responsible for their production.

**Article 7. Prohibiting the Production, Processing and Marketing of Goods With Radioactive Contamination**

The production, processing and marketing of radioactively contaminated goods, including the use of such goods as additives to clean raw materials, with the exception of goods of a scientific-production and research nature, are prohibited.

**Article 8. Information on the Levels of Radioactive Contamination**

The UkSSR Council of Ministers shall provide citizens of the UkSSR with full, prompt and accurate information on the levels of contamination with radioactive substances of the areas in which they live or work, on the level of contamination with radionuclides of food products and property, and regarding all requirements and conditions needed for observing a radiation safety regime and the right to public control over the state of pollution.

**Section II****Status of Individuals Who Are Victims of the Chernobyl Catastrophe****Article 9. Definition of Individuals Who Have Suffered As a Result of the Chernobyl Catastrophe**

Individuals who have suffered as a result of the Chernobyl catastrophe include the following:

1. Participants in eliminating the consequences of the accident at the Chernobyl AES—citizens who directly participated in liquidating the accident and its consequences.
2. Victims of the Chernobyl catastrophe: citizens, including children, who were subject to the effect of radioactive contamination as a result of the Chernobyl catastrophe.

**Article 10. Defining Individuals as Participants in the Liquidation of the Consequences of the Accident at the Chernobyl AES**

Participants in the liquidation of the consequences of the accident at the Chernobyl AES shall include citizens who directly participated in any work related to the elimination of the accident itself, its consequences in the zone of condemnation, and the organization of the evacuation from this zone, or who were temporarily assigned or directed to carry out work in said zone, including military personnel, which includes reservists, personnel of state and public organizations, regardless of departmental affiliation, as well as those who worked at the centers for the medical treatment of the population and for deactivation of the equipment, both within the zone and outside its limits.

Also classified as participants in eliminating the consequences of the accident at the Chernobyl AES are citizens who participated in eliminating the consequences of

other nuclear accidents and tests and in military exercises involving the use of nuclear weapons.

**Article 11. Defining Individuals Classified as Victims of the Chernobyl Catastrophe**

The following are classified as victims of the Chernobyl catastrophe:

1. Those evacuated from the zone of condemnation and resettled out of the zone of the unconditional (mandatory) and guaranteed voluntary resettlement and those who left these zones on their own after the accident;
2. Individuals who moved out of the territory of radioactive contamination, stipulated in Point 3 and 4 of Article 2, based on medical indications, pregnant women and families with minor children;
3. Permanent residents or individuals working in the zones of unconditional (mandatory) and guaranteed voluntary resettlement;
4. Individuals who are permanent residents or work on the territory of zones of intensified radioecological control;
5. Children born after 26 April 1986, who are the offspring of either parent who participated in eliminating the consequences of the Chernobyl AES accident or who suffered from the Chernobyl catastrophe under conditions in which they could have directly been exposed to the effect of radioactive radiation;
6. Other individuals whose illnesses have been acknowledged as related to the consequences of the Chernobyl catastrophe.

In addition to the individuals listed in Part 1 of this article, also classified as victims of the Chernobyl catastrophe are citizens, including children, in whose thyroid gland the radiation doses exceed the levels set by the UkSSR Ministry of Health and approved by the National Commission for the Radiation Safety of the Ukrainian Population.

**Article 12. Establishing Causal Relation Between Worsened Health and the Consequences of the Chernobyl Catastrophe**

The causal relation between the worsened state of health, diseases and partial or total disability of citizens, who were victims of the Chernobyl catastrophe, is considered established (regardless of the existence of dosimetric indicators or their absence) if the authorized medical institution has not confirmed the lack of such a connection.

**Article 13. Responsibility of the State for the Harm Caused to the Citizens as a Result of the Chernobyl Catastrophe**

The state assumes full responsibility for:

1. Any harm to the health or loss of work fitness of citizens and their children, who have suffered as a result of the Chernobyl catastrophe;

2. The loss of the breadwinner, if his death is related to the Chernobyl catastrophe;

3. Material damage caused to the citizens and their families as a result of the Chernobyl catastrophe, in accordance with the present law and existing legislation;

4. Promptness of medical examination and determination of the doses of radiation of the participants in eliminating the consequences of the accident at the Chernobyl AES and of the victims of the Chernobyl catastrophe.

**Article 14. Defining the Categories of Individuals Who Suffered As a Result of the Chernobyl Catastrophe for the Purpose of Establishing Benefits and Compensations**

The following categories of individuals who have suffered as a result of the Chernobyl catastrophe shall be defined for purposes of establishing benefits and compensations:

1. Participants in the elimination of the consequences of the accident at the Chernobyl AES and victims of the Chernobyl catastrophe, who are fully or partially disabled as a result of the Chernobyl catastrophe, people suffering from radiation disease, and individuals whose illness is related to the consequences of the Chernobyl catastrophe: category 1;

2. Participants in the elimination of the consequences of the accident at the Chernobyl AES working in the condemnation zone in 1986-1987, and victims of the Chernobyl catastrophe who were evacuated from the condemned zone: category 2;

3. Participants in the elimination of the consequences of the accident at the Chernobyl AES, who worked in the condemned zone in 1988-1990 and victims of the Chernobyl catastrophe who are permanently at work or worked or else live or lived on the territories of zones of unconditional (mandatory) and guaranteed voluntary resettlement: category 3;

4. Individuals permanently working or living on the territories of zones of intensified radioecological control: category 4.

Participants in the elimination of the consequences of the accident at the Chernobyl AES in 1988 and subsequent years, who worked or are working in the most heavily contaminated sectors of the zones of radioactive contamination may be classified in category 2 or 3 by decision of the UkSSR State Committee for the Protection of the Population from the Consequences of the Accident at the Chernobyl AES.

Citizens who have participated in the elimination of other nuclear accidents and tests, and in military exercises involving the use of nuclear weapons, are classified in categories, 1, 2 or 3, as defined by the UkSSR Council of Ministers.

**Article 15. Grounds for Granting Benefits and Compensations to Citizens Who Are Victims of the Consequences of the Chernobyl Catastrophe**

Grounds for granting benefits and compensations to citizens who were victims of the consequence of the Chernobyl catastrophe are the levels of contamination with radionuclides of the territory or the dose of radiation exceeding the maximal rates established by the National Commission for Radiation Safety of the Ukrainian Population, or their maximally possible value established on the basis of computations, and the period of work for eliminating the consequences of the accident at the Chernobyl AES and degree of disability.

The determination of the conditions of pollution and radiation doses through computations will be done by the UkSSR Council of Ministers on the basis of the presentations of the respective state organs and executive committees of oblast soviets of people's deputies.

**Section III**

**Uniform System for the Registration and Medical Coverage of Individuals Victim of the Consequences of the Chernobyl Catastrophe**

**Article 16. Organization of the Uniform State Registration of Individuals Who Have Suffered As a Result of the Chernobyl Catastrophe**

In order to ensure the systematic examination of individuals who suffered as a result of the Chernobyl catastrophe, the UkSSR Ministry of Health will organize the uniform registration of individuals (a republic register).

Ministries, departments, public organizations and executive committees of local soviets of people's deputies shall submit to the UkSSR Ministry of Health full and exhaustive information concerning individuals who participated in the elimination of the consequences of the accident at the Chernobyl AES, evacuees, the resettled and those who left by themselves the zones of condemnation and unconditional (mandatory) and guaranteed voluntary resettlement and of intensified radioecological control, and those who live and work in such zones, for registration in the Republic Register of the necessary information on the calendar length of their work or life in the contaminated territories, their place of work or residence, their radiation doses and the results of their medical examination.

The number of their entry in the republic register shall be reported to the citizens and to the medical establishment at their place of residence or work.

#### **Article 17. Organization of the Medical Examination and Treatment of Individuals Who Have Suffered as a Consequence of the Chernobyl Catastrophe**

The UkSSR Council of Ministers, the UkSSR Ministry of Health, the UkSSR Ministry of Social Security, the UkSSR Ministry of Public Education, the state public organizations and the executive committees of the local soviets of people's deputies shall organize the annual medical examination (outpatient treatment) and the sanatorium-resort treatment of all individuals who have suffered as a result of the Chernobyl catastrophe and shall introduce a system of radiation-ecological, medical-genetic, and medical-demographic monitoring on the territory of the republic. In the areas of the highest concentration of the victims, these authorities shall establish specialized centers, including centers for children, for their examination and treatment and sociopsychological rehabilitating and vocational guidance.

Citizens who have suffered as a result of the Chernobyl catastrophe must be subject to mandatory examination in medical establishments.

Citizens who have become disabled as a result of the Chernobyl catastrophe, and who have reached the age of 44 for women and 49 for men, shall be assigned a permanent disability group classification.

Citizens who have suffered from radiation disease of any degree, as a result of which have been classified in the first or second group of disability, shall retain their disability status permanently, regardless of age. An examination of such disabled individuals by the medical-labor expert commission shall be made at their request.

#### **Article 18. Nutrition Standards in Specialized Treatment, Treatment-Sanatorium and Resort Establishments**

In the case of victims of the Chernobyl catastrophe, on the recommendations of the UkSSR Ministry of Health the UkSSR Council of Ministers shall set additional standards for rational nutrition in specialized treatment, treatment-sanatorium and resort establishments.

### **Section IV**

#### **Social Protection of Citizens Who Suffered as a Result of the Chernobyl Catastrophe, General Compensations and Benefits**

#### **Article 19. Granting Compensations and Benefits to Citizens Who Suffered As a Result of the Chernobyl Catastrophe**

The compensations and benefits described in this section shall be extended to all citizens who suffered as a result of the Chernobyl catastrophe, including children, in accordance with the established categories.

#### **Article 20. Compensations and Benefits to Citizens Classified in Category 1**

Individuals classified in category 1 (Point 1, Article 14) shall be granted the following compensations and benefits:

1. Free prescription drugs.
2. Free dental prostheses on a priority basis.
3. Service in medical-prophylactic establishments and pharmacies on a priority basis.
4. Free annual sanatorium-resort treatment on a priority basis and compensation for the cost of independent sanatorium treatment.
5. Admission in polyclinics to which they were assigned while employed, after their retirement or change of work place.
6. Right to annual medical examination and outpatient treatment including the services of the required specialists.
7. Priority right of employment should there be personnel reductions or reductions in the number of workers, and in job placement.

In the case of layoffs, including the closing down of enterprises, the citizens will receive aid amounting to three monthly wages and, if they so desire, retain their salary, and rate (salary) at their new place of work. They are also guaranteed job placement in accordance with their wishes or the possibility of learning new skills (specialties) while retaining, in accordance with the established procedures, their average wage for the entire period of retraining, not to exceed one year.

In transferring to lower-paid work because of their state of health, the difference between the previous salary and the wages at the new job shall be paid to them, for the entire period.

8. Aid for temporary disability, in the amount of 100 percent of the average wage, regardless of the length of labor seniority.
9. Aid shall be paid to working disabled for temporary disability for up to four consecutive months or 3 months per calendar year.
10. Priority housing to individuals who need improvements in their housing conditions (including the families of citizens who perished or died). Entitled individuals shall be ensured housing within the year from the day of submission of their petition.

The right to improved housing conditions and apartments is granted to individuals who have a living area below the average availability to citizens in a given settlement or else who live in communal housing facilities.

Individuals who have suffered from radiation disease to any degree and who have become disabled as a result of



The Chernobyl catastrophe shall be granted additional housing area in the form of a separate room.

Families who have lost their breadwinner as a result of the Chernobyl catastrophe have the right to additional housing area the size of which shall be determined by the USSR Council of Ministers;

11. Reduced payments for housing area within the rates stipulated by the existing legislation and for the use of communal services, electric power and gas by 50 percent to said individuals and members of the families living with them, as well as to families to have lost their breadwinner, who was victim of the Chernobyl catastrophe;

Individuals living in houses without central heating shall be compensated for 50 percent of the cost of fuel based on the rates for sale of said fuel to the population;

12. The right to assigning to individuals belonging to this category, free of charge and as their personal property, the housing premises occupied by them and their families within the average range of availability;

13. The right to a priority free acquisition of a car of the ZAZ-986 model (in the presence of corresponding medical indications or first and second group disability). If the disabled so wishes, he may purchase on a priority basis a different model automobile by paying the difference in the cost;

14. The right to obtaining food products based on physiological standards, with assignment to corresponding stores, with a 50 percent discount;

15. Free use of all modes of urban and suburban transportation (other than taxicabs) and public use automobile transportation (other than taxicabs) in rural areas on republic territory;

16. The right to be issued a medical certificate for the entire period of treatment in sanatoriums and specialized medical establishments, including the commuting to said establishments, with a payment of aid based on social security, regardless of who has issued the travel voucher on whose account it was issued;

Priority mandatory placement of their children in preschool establishments, regardless of departmental affiliation;

18. Exemption from the payment of taxes and fees of all kinds;

19. Right to a free annual round trip anywhere in the country by air or rail, water or automobile, with the right of priority in obtaining tickets;

20. Priority in the allocation of plots for individual housing construction, truck gardening and market gardening;

21. Obtaining interest-free loans for individual housing (cooperative) construction, 50 percent of it to be paid by the state budget, as well as interest-free loans for building dachas;

22. Use of regular leave at times convenient to them, and obtaining additional leave with pay for 14 days annually;

23. Priority right to join housing construction (housing cooperatives, cooperatives for the construction and operation of collective garages and parking areas and their technical servicing, joining commercial gardening cooperatives, purchasing garden houses or materials for their construction and for individual house building;

24. Obtaining immediate services in establishments, enterprises, communications organizations, consumer services, public catering, housing-communal facilities and interurban transportation;

25. Immediate right to top priority in purchasing industrial goods in greater demand, including a passenger car, motorcycle, motorboat, television set, refrigerator, furniture, washing machine or vacuum cleaner;

26. Right to enroll without competition in a higher or secondary specialized educational institution or vocational-technical school or in courses for vocational training, with mandatory right to community housing for the duration of the training, and guaranteed scholarship increased by one half. Graduates of secondary educational institutions with excellent grades (excellent rating) shall be accepted in higher educational institutions, based on the results of an interview, without examination;

27. Right to out of turn residency in social security establishments and to social security services at home if the patient has no close relatives living with him or her.

If the organization of such services is impossible, the social security establishments shall compensate for the cost of taking care of the sick;

28. Right to priority installation of telephone facilities;

29. Right to interest-free credit or loan for engaging in private labor activities or setting up a farm;

30. Right to cancel the unpaid part of the interest-free loan for equipping the residence of families for up to 5,000 rubles, obtained by those evacuated from the 30-kilometer zone at the expense of the state;

31. Payments based on medical certificates for temporary disability of individuals, who participated in eliminating the consequences of the accident at the Chernobyl AES may be computed, in accordance with their wish, on the basis of the average actual earnings which they received during the work on eliminating the consequences of the accident at the Chernobyl AES, without being restricted to double the wage or salary rate.

The same procedure shall apply in payments based on medical certificates for individuals whose temporary disability has been caused by any disease.

**Article 21. Compensation and Benefits to Citizens Classified in Category 2**

Individuals classified in category 2 (Point 2, Article 14) are entitled to the following compensations and benefits:

1. The right to the benefits stipulated in points 1, 2, 3, 5, 6, 7, 8, 11, 12, 16, 17, 18, 20, 22, 23, 25, 26, 27, 29, 30 and 31, Article 20;
2. Priority annual free travel vouchers to sanatoriums and resorts, issued at their place of work, and compensation of the cost of individual sanatorium-resort treatment;
3. Priority in acquiring housing area to individuals who need improvements in their housing condition

The right to improved housing conditions and to apartments is granted to individuals whose housing space is below the level of the average space available to citizens in a given settlement or who live in communal apartments.

Families who have lost their breadwinner as a result of the Chernobyl catastrophe have the right to additional housing area the size of which shall be determined by the USSR Council of Ministers;

4. Retaining the average wage of the previous job for workers transferred on the basis of medical indications to a lighter work, for the entire period of their employment.
5. The right to a 50 percent reduction in the cost of a round-trip anywhere in the country and back by air or rail or by water or automobile;
6. The right of telephone service on a priority basis;
7. The right to obtaining food products according to medical standards, assigned to the proper stores, with a 25 percent discount;
8. Obtaining an interest-free loan for individual housing (cooperative) building, 25 percent of which to be repaid with a loan from the state budget, and an interest-free loan for the construction of a dacha;
9. Receiving for one year their average wage for workers who participated in eliminating the consequences of the accident at the Chernobyl AES in 1986-1987 and who, on the basis of medical indications, were removed from the condemned zone (Point 1, Article 2) and transferred to lower paid jobs or assigned to retraining;
10. Priority services to participants in the elimination of the consequences of the accident at the Chernobyl AES

in 1986-1987 at establishments, enterprises, communications organizations, consumer services, public catering, housing-communal facilities and interurban transportation;

11. Free use of all types of urban and suburban transportation (other than taxicabs) and public use automotive transportation on the territory of the republic to participants in eliminating the consequences of the accident at the Chernobyl AES in 1986-1987

**Article 22. Compensations and Benefits to Citizens Classified in Category 3**

Individuals classified in category 3 (Point 3, Article 14) are granted the following compensations and benefits:

1. The right to the benefits stipulated in points 3, 5, 6, 7, 8, 17, 20, and 27 of Article 20;
2. Privileged priority acquisition of travel vouchers for sanatorium-resorts at their place of work, and partial compensation for the cost of individual sanatorium-resort treatment;
3. The right to up to 14 days unpaid leave to either parent of minor children living on the territory of the radioactive contamination zones;
4. Priority right to join a housing-construction (housing) cooperative (in Kiev City and in resort areas providing that a residential permit has been granted);
5. Obtaining an interest-free loan for individual housing construction;
6. Noncompetitive status for those who have scored positive entrance grades for enrollment in educational establishments is granted to individuals who live on radioactively contaminated territories and have been assigned to training in accordance with the plan for target training with mandatory hostel facilities and a guaranteed scholarship, increased by 50 percent;
7. The right to food products in accordance with physiological standards and to food products with radiation protection agents;
8. Right to priority in obtaining industrial durable goods;
9. Right to apartments for citizens living in communal premises, regardless of the size of their housing area;
10. Citizens with privately owned housing, resettled in 1986-1990 in state apartments are granted the right to ownership of such apartments free of charge, within the range of average availability standards;
11. Citizens who worked on the territory of zones of unconditional (mandatory) and guaranteed voluntary resettlement for no less than 3 years have the right to full ownership of the housing they occupied in those zones

12. Right to preferential terms for obtaining credit or loans for setting themselves up in private business or farming;

13. Individuals who lived, prior to their resettlement, on zones of unconditional (mandatory) and guaranteed voluntary resettlement are granted the benefits stipulated in points 1, 2 and 18 of Article 20 and the right to priority free sanatorium-resort vouchers from their place of work;

14. Individuals who lived, prior to resettlement, in houses without central heating are repaid 50 percent of the cost of the fuel purchased within the limits stipulated for sale to the population.

#### **Article 23. Rights of Individuals Classified in Category 4**

Individuals classified in category 4 (Point 4, Article 14) are granted the following compensations and benefits:

1. The right to benefits stipulated in points 1, 3, 5, 6, 7, 8, and 18, Article 20, and points 3, 5, 6, 7, 8, 9, and 12, Article 22;

2. The right to priority dental prostheses at 50 percent discount;

3. Preferential supply of sanatorium-resort travel vouchers issued by their place of work, as well as partial compensation of the cost of individual sanatorium-resort treatment;

4. Right to free of charge ownership of housing of citizens who worked in the zone of increased radioecological control for no less than five years;

5. Compensation of 50 percent of the cost of fuel purchased within the range of the established norms for individuals living in homes lacking central heating

#### **Article 24. Military Service Requirements for Individuals Who Have Suffered As a Result of the Chernobyl Catastrophe**

1. Individuals of draft age who suffered as a result of the Chernobyl catastrophe shall not be assigned to perform military service on a territory with increased levels of radioactive contamination or in military units with nuclear systems or which use other sources of ionizing radiation, superhigh frequencies and missile fuel components.

2. Drafted military servicemen who suffered as a result of the Chernobyl catastrophe shall be mandatorily granted annual leave no less than 30 days, excluding travel time

3. Drafted military personnel who suffered as a result of the Chernobyl catastrophe shall undergo a mandatory annual medical examination.

### **Section V**

#### **Protection of Children Who Suffered From the Chernobyl Catastrophe**

##### **Article 25. Identifying Children Who Suffered From the Chernobyl Catastrophe**

Children who suffered from the Chernobyl catastrophe include minor children who:

Were evacuated from the condemned zone;

Live or lived in the zone of the unconditional (mandatory) resettlement;

Live or lived in the zone of guaranteed voluntary resettlement;

Live or lived in the zone of intensified radioecological control;

Were born after 26 April 1986 if either parent participated in eliminating the consequences of the accident at the Chernobyl AES or suffered from the Chernobyl catastrophe, under conditions in which they may have been indirectly exposed to the influence of radioactivity;

Received a dose of radiation of the thyroid gland exceeding the level determined by the UkSSR Ministry of Health and ratified by the National Commission for Radiation Safety of the Ukrainian Population, or else whose illnesses have been acknowledged as related to the influence of the consequences of the Chernobyl catastrophe.

##### **Article 26. Treatment of the Affected Children**

The rescuing, treatment and rehabilitation (including psychological) of preschool and school-age children who were affected is a priority in all medical programs and steps related to eliminating the consequences of the Chernobyl catastrophe.

The treatment of the affected children is organized on the basis of the best domestic sanatorium-resort establishments and specialized medical centers, equipped with modern diagnostic and treatment equipment, and supplied with modern medicines, administered by the most experienced domestic and foreign specialists using their own methods, equipment and medicines.

##### **Article 27. Ensuring Food Products for the Affected Children**

The affected children are ensured, in accordance with physiological standards, as stipulated by the UkSSR Ministry of Health, with food products and food supplements which help to eliminating radionuclides from the body. Children of parents classified as first and second category victims, undergoing outpatient treatment (as established by the medical consultation commission) shall be refunded 50 percent of the cost of the food products they receive

#### **Article 28. Benefits and Compensations to Affected Children and Their Parents**

The affected children and their parents have the right to the following:

1. Full state support of the children until they reach school age;
2. Paid medical leave to one of the parents or to individuals replacing them for caring for a sick child under 14—100 percent—regardless of the length of job service, covering the entire period of the illness, including sanatorium-resort treatment;
3. Free transportation, using all types of transport (other than taxicabs) for the child and the individual who accompanies the sick child to the place of treatment (rehabilitation), care, and back (as assigned by the medical establishments), with the right to priority ticket purchase;
4. Free prescription drugs;
5. Annual free travel voucher to the affected children for health recovery purposes for no more than 2 months.

The affected children under 10 shall be ensured travel vouchers together with their parents or with the individuals taking care of the child;

6. Monthly payment of 50 percent of the minimal wage in the republic, regardless of any other payments, per child of school age evacuated from the condemned zone or born after 26 April 1986 to one of the parents classified in categories 1 or 2, under conditions in which the child may have been indirectly exposed to the radioactivity;

7. Annual payment to families raising children, who have become disabled as a result of the Chernobyl catastrophe (confirmed by an authorized medical institution), and compensation for the damage to the health of any disabled child, totaling three minimal wages paid in the republic;

8. Monthly payment to the families of children who have become disabled or are undergoing outpatient treatment for any illness resulting from the Chernobyl catastrophe (as confirmed by a medical consultation commission) and to the children of parents classified as first or second group disabled or who died as a result of the Chernobyl catastrophe, to the amount of the minimal wage in the republic, per child, instead of the payments stipulated in Point 6 of this article;

9. A separate room by a child who has become disabled as a result of the Chernobyl catastrophe and who needs special care;

10. Increased pregnancy and maternity leave to women victims of the Chernobyl catastrophe, of up to 90 days

with travel vouchers granted during the pregnancy period, for treatment in specialized health recovery establishments.

Payments in cases of partial paid leave to take care of a child shall be double the amount of aid stipulated by the current legislation. Pregnant women shall be ensured additional nutrition based on standards established by the UkSSR Ministry of Health;

11. Free food to school students attending secondary educational institutions and vocational-technical schools, who live in territories with radioactive contamination (points 2, 3, and 4, Article 2) and were evacuated from the condemned zone;

12. Ensuring food products to affected children who do not attend children's preschool and school establishments, for the amount of the average cost of nutrition in such establishments, as set by the local soviets of people's deputies, or monetary compensation to the parents if so desired;

13. In the case of nonworking wives (fathers, guardians) retaining uninterrupted labor seniority for the purpose of the computation and payment of labor pensions, for the time spent in caring for an affected child under 12.

#### **Article 29. Aid to Affected Children of Low-Income Families Living in a Radioactive Contamination Territory**

Aid to affected children of low-income families living in a radioactive contamination territory shall be doubled compared to the respective aid stipulated in the current legislation.

### **Section VI**

#### **Protection of the Population Victimized by the Chernobyl Catastrophe**

#### **Article 30. Providing Housing Premises to Citizens Who Were Evacuated or Resettled (or Are Resettling)**

1. Citizens who were evacuated or resettled (or are resettling) shall be granted housing premises free of charge, as a rule in settlements, houses and apartments especially built to this effect

2. Citizens who are resettling on their own in other rayons in the republic in a new place of residence (other than Kiev and resort areas) will be included by the enterprises, establishments and organizations in which they have been placed, in separate lists for priority housing without the need to submit documents on surrendering the premises they formerly occupied

Citizens who, for a variety of reasons, have not been able to find a job and settle in the chosen place of residence, shall be registered in separate lists for priority housing of the executive committees of the city or rayon soviets of people's deputies (other than Kiev and resort areas) on the basis of an assignment issued in accordance with regulations



The lack of a residency permit or job may not be grounds for refusal to register in any settlement in the UkSSR (other than Kiev and resort areas) and for granting housing. Housing shall be granted within three years.

The UkSSR Council of Ministers shall provide the local soviets of people's deputies specific capital investments for housing construction in accordance with the number of resettled families.

3. In order to secure housing for resettled families, the executive committees of the local soviets of people's deputies, enterprises, establishments and organizations, as well as the citizens themselves may purchase in any settlement in the republic (other than in Kiev and resort areas) on the basis of contractual prices, housing and apartments from citizens who are their owners, as well as vacant houses and apartments belonging to the public housing fund, on the basis of their residual balance-sheet value.

If the housing area of the purchased house (apartment) exceeds the stipulated norm, the cost of the surplus area and the corresponding part of yard premises shall be paid for by the citizens themselves.

The citizens who have built or purchased housing with gardens with outbuildings, or else premises paid out of their own funds shall recover their cost to the amount stipulated by the local soviets of people's deputies.

The executive committees of the local soviets of people's deputies, enterprises, establishments, organizations, kolkhozes and private citizens shall be exempt from paying state taxes in signing a contract for purchase or sale of houses and apartments.

4. The citizens have the right to obtaining on a priority basis plots for individual housing construction (in Kiev and resort areas with a residential permit) with guaranteed availability of the necessary construction materials, and sign contracts with contracting organizations for the building of homes with yards.

The citizens will be compensated for 50 percent of the cost of the housing they have built (within the existing standards) if they move out of the publicly-owned housing.

5. Citizens have the right to priority joining of housing construction (housing) cooperatives, regardless of the period of residency and residential permits for a given settlement (for Kiev and resort areas, with a residential permit).

The citizens are refunded 50 percent of the cost of the housing they have built (within the limits of the existing standards) should they move out of publicly-owned housing.

6. Citizens resettled in temporary housing premises have the right to subsequent permanent housing with amenities or to be provided with construction facilities.

#### **Article 31. Priority Housing for Individuals Who Are Resettled in Housing Owned by Close Relatives**

Citizens who are disabled or retired, who are resettled in accordance with the present law in the housing of close relatives (parents, children, grandchildren, full brothers and sisters) have the right to priority housing as homeless. Said benefit may be used one time only.

#### **Article 32. Compensation Paid to Citizens for Lost Property in Connection With Evacuation or Resettlement**

Compensation paid to citizens for property lost as a result of the evacuation or resettlement includes the following:

1. The value of buildings (housing, garden and dacha, garage, and farm buildings and installations), paid in full, based on the appraisal in accordance with insurance documents and the funds obtained from state mandatory and voluntary insurance; in cases of disagreement and of uninsured buildings, based on the appraisal of the Technical Inventory Bureau.

2. The value of livestock subject to mandatory slaughter for reasons of increased radioactive contamination (full amount paid by the state insurance authorities, based on insurance documents).

3. The value of fruit and berry plants, crops and uninsured livestock (at rates set by the UkSSR Council of Ministers).

4. The value of household property which, based on the extent of radioactive contamination, cannot be moved to the new place of residence (in accordance with the actual value minus wear and tear, as defined by the commissions of the respective soviets of people's deputies).

5. Expenditures for setting up in public property areas truck gardening associations, to the extent of the contributed shares or as assessed by the Technical Inventory Bureau.

6. The right to monetary compensation to citizens to have not lived on said territory but were given property either inherited or on a different basis, as stipulated by the current legislation.

7. Citizens who, until the promulgation of this law, obtained loans for the construction of housing, dachas or garages on contaminated territories, will pay no interest on the used portion of the loan.

This article is extended to citizens with dachas, homes with yards, fruit and berry plants in truck gardening associations and other settlements located in contaminated territories from which no clean produce can be obtained.

**Article 33. Compensation and Benefits Granted to Citizens Evacuated or Resettled (Resettling) in a New Place of Residence**

Citizens who were evacuated or resettled (or are resettling) in a new residential area have the right to the following:

1. To receive one-time aid amounting to three minimal wages paid in the republic per family member. The same amount will be paid in aid to pensioners (regardless of the type of pension) and to citizens who are assisted from local budget funds and to members of their families;

2. Refunding the cost of the trip, and the cost of moving of the property by rail, water or automotive transportation (other than in cases in which said transportation facilities are provided free of charge);

3. Retaining the average wage for the days of gathering along the way and settling in the new place of residence, not to exceed 14 days, and for the time spent in traveling, based on the average monthly earnings at the previous work place;

4. The expenditures related to the moving shall be refunded by the local soviets of people's deputies at the previous place of residence out of funds appropriated for the elimination of the consequences of the Chernobyl catastrophe;

5. Obtaining interest-free loans for home furnishings, not to exceed 5,000 rubles per family, repayable over a period of 15 years from the time of obtaining the loan;

6. A loan of 10,000 rubles per family member (not to exceed 60,000 rubles) for independent (if so desired) construction of housing (apartment). This loan is granted at the place of residence or the place where the housing will be built, out of funds appropriated for capital construction. The repayment of the loan will be made to the banks on a quarterly basis, depending on the amount of use of funds for construction or of the purchase and sale, but not to exceed the actual expenditures;

7. Priority in job placement by the local soviets of people's deputies, enterprises, establishments and organizations at the new place of residence, taking into consideration the profession, specialty and skill. Should such job placement prove to be impossible, the citizens are guaranteed other work in accordance with their wishes and public needs or the possibility of learning new skills (specialties) while receiving the average wage for the entire period of retraining, but not to exceed one year.

Citizens who have worked in contaminated territories prior to their resettlement will retain in their new job their work seniority and work longevity in their specialty, their acquired qualifications and title, in accordance with and under the conditions governed by the current legislation

8. Priority in purchasing goods for which compensation has been paid in accordance with Point 4, Article 32.

Citizens who have been resettled out of radioactively contaminated territories in accordance with Article 4 of

this law to other rural settlements will be exempt from paying the agricultural tax, tax on buildings, tax on land and tax on owners of means of transportation for a period of three years from their resettlement.

**Article 34. Compensation for Citizens Living in Radioactively Contaminated Territories**

Citizens who live in radioactively contaminated territories shall be paid, on a monthly basis, a daily allowance related to the limited consumption of food products produced locally and in their private auxiliary farms, in the following amounts:

In the zone of intensified radioecological control, 30 percent of the minimal wage paid in the republic;

In the zone of guaranteed voluntary resettlement, 40 percent of the minimal wage paid in the republic;

In the zone of unconditional (mandatory) resettlement, 50 percent of the minimal wage paid in the republic.

**Article 35. Reserved Housing for Individuals Either Assigned or Voluntarily Going to Work in Zones of Condemnation or Unconditional (Mandatory) and Guaranteed Voluntary Resettlement**

Individuals assigned or voluntarily going to work in zones of condemnation or unconditional (mandatory) resettlement or guaranteed voluntary resettlement will have the right to keep their housing in their previous place of residence.

## Section VII

**Features in Regulating the Work of Citizens Working in Radioactively Contaminated Territories**

**Article 36. Wages of Citizens Working in Radioactively Contaminated Territories**

The wages of citizens working in radioactively contaminated territories shall be based on higher wage rates (piece rates) and salaries, taking into consideration the level of radioactive pollution with cesium isotopes, the difficulty of the work and working conditions, as follows:

From 1 to 5 Ci/km<sup>2</sup>: 20-30 percent.

From 5 to 10 Ci/km<sup>2</sup>: 30-40 percent.

From 10 to 15 Ci/km<sup>2</sup>: 40-60 percent.

From 15 to 30 Ci/km<sup>2</sup>: 60-80 percent.

Over 30 Ci/km<sup>2</sup>: 80-100 percent.

The list of the types of work and specific amounts of percentage supplements, depending on the difficulty of the work and the working conditions, shall be established by the UkSSR Council of Ministers.

The same rate of increase shall apply to pensions, scholarships, and aid to citizens living in radioactively contaminated territories.

Pensioners and disabled, whose disability was caused by the Chernobyl catastrophe, may receive higher payments computed on the basis of the average wage which they earned prior to their retirement or disability.

**Article 37. Payment for the Labor of Military Servicemen, Military Reservists, or Civilians in the Military, Serving in Territories With Radioactive Contamination**

1. Military servicemen, military reservists or civilians working for the military, summoned to assemblies and assigned to eliminating the consequences of the Chernobyl catastrophe, as well as those who perform their service on territories with radioactive contamination, where benefits in wages to the population living and working in those areas are contemplated, shall be paid, over and above their average payment, increased payments as per Article 36 of this law, for all the calendar days of work, on the basis of a pay certificate submitted to the military unit.

2. Military servicemen in military units and command and private members of the organs of internal affairs and state security of the UkSSR shall receive higher wages based on their salaries and military or special rank.

**Article 38. Wages of Workers Assigned to Work in Radioactively Contaminated Territories**

Workers temporarily transferred or assigned to work in radioactively contaminated territories shall retain their average wage at their basic place of work and receive daily allowances in accordance with the current legislation. In the condemned zone daily allowances shall be paid in an increased amount as set by the UkSSR Council of Ministers. The increased wages in said territories for work shall be based on Article 36 of this law.

Workers assigned to the construction of projects related to eliminating the consequences of the Chernobyl catastrophe shall receive, instead of daily allowances, 75 percent of their average wage at their basic place of work.

The wages of workers of enterprises, establishments and organizations engaged in the construction of projects in accordance with the program for eliminating the consequences of the Chernobyl catastrophe outside the zones of radioactive contamination, shall receive a 20 percent supplement to the wage rates (salaries), which shall be included in the cost of the projects.

**Article 39. Seniority Payments to First, Second, Third, and Fourth Category Workers**

Workers in the first, second, third, and fourth categories have the right to an annual one-time payment for seniority, regardless of the departmental affiliation of enterprises, establishments, and organizations or their place of work and military service. The amount of the payment shall be determined by the respective enterprises, and organizations, but shall be no less than

Table 1.

Total Length of Service	Amount of Annual Payment Based on the Monthly Wage Rate (Salary, Cash Allowance)
From 1 to 3 Years	0.8
3 to 5 Years	1.0
5 to 10 Years	1.2
10 to 15 Years	1.5
Over 15 Years	2.0

Pensioners shall receive an annual payment equivalent to two monthly pension payments.

**Article 40. Wages to Personnel of Health Care, Public Education and Culture Establishments**

Workers employed in the specialized establishments of the UkSSR Ministry of Health, who are permanently employed in providing medical aid to victims of the Chernobyl catastrophe, shall have their salaries increased by 25 percent; those providing medical services and working in public education and culture on contaminated territories shall be paid in accordance with their contract.

Problems related to ensuring contractual conditions shall be resolved by the UkSSR Council of Ministers.

**Article 41. Wages of Workers Engaged in the Special Processing, Utilization, and Study of Raw and Other Materials With Increased Radioactivity, and in Controlling, Repairing and Specialized Processing of Technical Facilities With Radioactive Pollution**

The wages of personnel engaged in the special processing, utilization and study of raw and other materials with increased radioactivity will be increased by 25 percent compared to the regular wage (piece rate) and salary, providing that the enterprises are located outside the zones of radioactive contamination and the permanent external radiation dose at the work place is in excess of 50 microroentgen per hour.

A 25 percent increase in the wage rates (piece rates) and salaries shall be paid for repairing and servicing technical facilities and equipment and their special processing and dosimetric control, providing that the surface contamination exceeds the stipulated standards.

**Article 42. Payments for Days Off and Holidays in Radioactively Contaminated Territories**

During days off and holidays in territories with radioactive contamination, in accordance with the current legislation, double wages shall be paid, taking into consideration the additional wages paid in accordance with Article 36 of this law.

**Article 43. Retention of the Average Wage and Labor Seniority of the Workers in the Case of Dismissal as a Result of Resettlement**

Workers who are laid off by enterprises, establishments and organizations due to cancellation of the labor contract because of resettling out of radioactively contaminated zones (items 2, 3, and 4, Article 2), shall retain their wage and labor seniority for the job placement period but not to exceed 3 months from the day of dismissal.

The average wage and labor seniority shall be retained during the job placement period for the fourth month following the dismissal as well, providing that the worker has applied within the proper time (within 1 month after the layoff) to the job placement authority but was not found a job.

**Article 44. Compensation For the Time of Forced Waiting by Citizens Who Should Have Been Resettled Out of the Radioactive Contamination Zones**

Citizens who must be resettled out of the radioactive contamination zones (points 2, 3, and 4, Article 2) will be paid at their place of work the average monthly earnings until the time that housing has been granted, should they have to idle as a result of the termination of their labor activities due to the prohibited production and processing of goods.

**Article 45. Annual Leave to Workers Who Are at Work in (or Assigned to) a Radioactively Contaminated Territory**

1. Individuals who work in (who are assigned to) territories with radioactive contamination shall be granted an annual leave depending on the length of their work, as follows:

In areas of condemnation and unquestionable (mandatory) resettlement, 44 calendar days for each year of work, not counting the additional leave. The overall length of the leave should not exceed 56 calendar days.

In the zone of guaranteed voluntary resettlement: 37 calendar days per year of work excluding the additional leave. The total length of the leave should not exceed 49 calendar days.

In the zone of intensified radioecological control: 30 calendar days per year of work excluding the additional leave. The overall duration of the leave should not exceed 42 calendar days.

2. In all cases, the length of the annual leave should not be less than the one stipulated by the current legislation for any worker category.

**Section VIII**

**Pensions and Compensations to Individuals Classified in Categories One, Two, Three, and Four**

**Article 46. Compensations for the Damage Caused to the Health of Individuals Who Became Disabled As a Result of the Chernobyl Catastrophe, to Participants in Eliminating the Damage Caused at the Chernobyl AES, and to Families for the Loss of the Breadwinner**

The following one-time compensation shall be paid to individuals who became disabled and to the families who lost their breadwinner as a result of the Chernobyl catastrophe:

First group disabled, 10,000 rubles

Second group disabled, 7,000 rubles.

Third group disabled, 5,000 rubles

Families who lost the breadwinner as a result of the Chernobyl catastrophe, 10,000 rubles

Parents of those who died, 5,000 rubles

Annual aid for recovery shall be paid in the following amounts:

First and second group disabled: three minimal wages paid in the republic;

Third group disabled: two minimal wages paid in the republic.

Participants in the elimination of the consequences of the accident at the Chernobyl AES

1986-1987: Three minimal wages paid in the republic

1988: Two minimal wages paid in the republic

1989-1990: A minimal work wage paid in the republic

To each child of a family which has lost its breadwinner the minimal wage paid in the republic

**Article 47. Pensions to Individuals Classified in the First, Second, Third, and Fourth Categories**

Pensions paid to individuals classified in the first, second, third and fourth categories shall be as follows:

a. A state pension.

b. An additional pension for the damage caused to the health

**Article 48. Additional pension for damage caused to the health of Category One individuals**

Category one individuals shall receive a monthly additional pension for the damage caused to their health as follows:

First group disabled: 100 percent of the minimal pension for old age

Second group disabled: 75 percent of the minimal pension for old age

Third group disabled and individuals who have suffered from radiation disease of all grades and who are related to the influence of radioactive substances shall receive a minimal pension for old age



**Article 49. Additional Pension for Damage Caused to the Health of Individuals of Categories Two, Three and Four**

1. Category two individuals shall receive a monthly additional pension for the damage caused to their health of 30 percent of the minimal pension for old age.

2. Category three individuals shall be paid an additional pension for damage caused to their health of 25 percent of the minimal old age pension.

3. Category four individuals shall be paid an additional pension for the damage caused to their health of 15 percent of the minimal old age pension.

**Article 50. Multiple Compensation to Families for the Loss of the Breadwinner As a Result of the Chernobyl Catastrophe**

Incapacitated members of the family of a breadwinner, supported by the latter, have the right to a monthly compensation for the loss of the breadwinner as a result of the Chernobyl catastrophe. In the case of children, the monthly compensation shall be paid regardless of whether or not they were supported by the breadwinner.

Family members, who are considered incapacitated and dependent, shall be so defined in accordance with the USSR Law on Pensions to Citizens in the USSR.

Students attending vocational-technical schools or secondary specialized and higher educational institutions have the right to a monthly compensation for the loss of the breadwinner for the duration of their training in the schools but not past the age of 23.

A monthly compensation for the loss of the breadwinner shall be paid to each incapacitated member of the family supported by him, in the amount of 50 percent of the minimal pension for old age, regardless of any other pension stipulated in the current legislation.

**Article 51. Payment of Additional Pension for the Damage Caused to the Health and Monthly Compensation to the Families for the Loss of the Breadwinner**

Additional pension for the harm caused to the health and monthly compensation to families for the loss of the breadwinner as a result of the Chernobyl catastrophe shall be paid in full, regardless of earnings, other pensions or any other income.

**Article 52. State Pension to Category One Individuals and in Connection With the Loss of the Breadwinner**

Pensions for disability incurred as a result of crippling or illness, as well as pensions related to the loss of breadwinner as a result of the Chernobyl catastrophe shall be appointed to the amount of the restoration of the actual damage but no less than the amount stipulated by the USSR Law on Pensions to Citizens in the USSR.

**Article 53. Granting State Pensions to Individuals Who Work or Reside in Radioactively Contaminated Territories**

Individuals who work or reside in radioactively contaminated territories shall be granted pensions based on a lowering of the age of pensioning, as follows:

Number	Table 2. Victim Category	Lowered Age
1	Participants in eliminating the consequences of the Accident at the Chernobyl AFS.	10 Years.
2	Participants in eliminating the consequences of the Accident at the Chernobyl AFS who worked in 1986 in the Zone of Condemnation. Regardless of the Number of Working Days.	8 Years.
3	Participants in eliminating the consequences of the Accident at the Chernobyl AFS who worked in 1986 in the Condemnation Zone No Less Than 10 Working Days.	5 Years.
4	Participants in eliminating the consequences of the Accident at the Chernobyl AFS who worked in 1986 in the Condemnation Zone No Less Than 4 Working Days.	4 Years.
<p>Note: Participants in eliminating the consequences of the consequences of the accident at the Chernobyl AFS who did work underground under particularly harmful and particularly difficult working conditions (according to List No. 1 of types of production, work, profession, position, or indicator approved by the USSR Council of Ministers) for 10 years or more shall have their retirement age reduced additionally, by 5 years, in accordance with the appropriate regulatory article.</p>		
	Victims of the Chernobyl Catastrophe	Lowered Age
1	Evacuated from the 30-kilometer Territory of the Condemned Area in 1986.	10 Years.
2	Evacuated from other Territories of the Zone of Condemnation in 1986.	8 Years.
3	Individuals Who lived or have worked or work in the Zone of Condemnation (Mandatory resettlement).	4 Years (See Note under Article 53, Paragraph 1, for Limitation of Length of Working Days But Not More Than 5 Years).

Table 2.

Number	Victim Category	Lowered Age
	Individuals Who Lived or Live or Worked or Else Work in the Zone of Guaranteed Voluntary Resettlement	3 Years (See Note) and Additionally 1 Year for Each 2 Years of Living and Working There But No More than 6 Years
	Individuals Who Lived or Live or Else Worked or Work in the Zone of Intensified Radioecological Control	2 Years (See Note) and Additionally 1 Year for Each Three Years of Living or Working There But No More than 5 Years

Note: The minimal amount of lowering the pensioning age is established only for individuals who lived or worked in said zones from the time of the accident to 31 July 1986, regardless of the length of their stay within that period of time.

The assignment and payment of the pensions of said categories shall be based on the USSR Law on Pensions to Citizens in the USSR and this law.

#### Article 54. Benefits Based on Length of Work (Service)

The length of work (service) for eliminating the consequences of the accident at the Chernobyl AES shall be included in the labor seniority as years worked until 1 January 1988—triple—and, from 1 January 1988 to 1 January 1991—augmented by one-half (including according to list No. 1). As of 1 January 1991 and subsequent years, benefits in computing the length of work in the condemnation zone shall be determined by the UkSSR Council of Ministers.

The right to a full pension is granted to citizens classified in categories one, two, three and four, providing that their length of work is no less than:

For men—20 years

For women—15 years

#### Article 55. Benefits in Computing the Average Monthly Earnings

The computation of the average monthly earnings shall be based on the USSR Law on Pensions to Citizens in the USSR

If so preferred by those who request a pension, the average monthly actual earnings, for purposes of computing the pension, could be selected for any period from the 12 months of work on the territory with radioactive pollution. If the individual requesting a pension has worked less than 12 months, the average monthly earnings shall be determined by dividing the overall amount of earnings during the calendar months of work by the number of such months.

#### Article 56. Benefits in the payment of Pensions to Working Pensioners

Pensions to individuals who suffered as a result of the Chernobyl catastrophe shall be paid in their full amount, regardless of their other earnings (income).

Pensioners who work in zones of radioactive contamination shall be paid pensions increased by 25 percent of the amount of the minimal wage paid in the republic.

#### Article 57. Pensions to Military Personnel Who Participated in Eliminating the Consequences of the Chernobyl Catastrophe

The pensions of military servicemen, mobilized reservists, and commanders and privates in the organs of internal affairs and state security of the UkSSR shall be assigned in accordance with this law.

The pension shall be assigned according to their choice from earnings (upkeep) which they received during the period of work for the elimination of the consequences of the Chernobyl catastrophe.

If so preferred, military personnel, drafted reservists, commanders and privates in the internal affairs and state security organs of the UkSSR may be granted pensions for disability, and members of their families pensions for the loss of the breadwinner as a result of the Chernobyl catastrophe under the conditions of and according to the procedures defined in the current legislation for individuals who became disabled as a result of wounds, shell shock or maiming in the course of performing their duties and their military service (official duties).

If so desired, military servicemen in active service may receive a disability pension consisting of the quintuple minimal wage in the republic.

#### Article 58. Procedure for the Enactment of the USSR Law on Pensions to Citizens in the USSR for People Who Suffered As a Result of the Chernobyl Catastrophe

In accordance with this law, the USSR Law on Pensions to Citizens in the USSR, as pertaining to individuals who suffered as a result of the Chernobyl catastrophe shall be enacted in full as of 1 April 1991.

#### Article 59. Other Benefits and Compensations to Individuals Who Suffered As a Result of the Chernobyl Catastrophe

Individuals who suffered as a result of the Chernobyl catastrophe may be granted other benefits and compensations as stipulated by the current legislation.

## Section IX

### **Social Associations of Individuals Who Suffered As a Result of the Chernobyl Catastrophe**

#### **Article 60. Social Associations of Individuals Who Suffered As a Result of the Chernobyl Catastrophe**

Social associations of individuals who suffered as a result of the Chernobyl catastrophe shall be exempt from taxation and their enterprises and organizations from tax on profits to the amount which such social associations use for the exercise of their statutory activities. Such social organizations, their branches and enterprises shall be exempt from taxes on imports, exports and fees for goods imported and exported in accordance with their statutory activities.

## Section X

### **Concluding Stipulations**

#### **Article 61. Interpretation of the Procedure for the Application of This Law**

Interpretation of the procedure for the application of this law shall be provided by the UkSSR Council of Ministers, whose resolutions shall be mandatory for execution by ministries, departments in the republic, local organs of state management and enterprises, establishments, organizations, and kolkhozes located on republic territory, regardless of departmental affiliation.

#### **Article 62. Financing Expenditures Related to the Application of This Law**

The costs related to the application of the present law shall be financed out of funds appropriated for the elimination of the consequences of the Chernobyl catastrophe.

#### **Article 63. Responsibility of Individuals For Violations of This Law**

Individuals guilty of violating the stipulations of this law shall be held liable in accordance with the current legislation.

#### **Article 64. Procedure for Issuing Certificates to Individuals Who Suffered As a Result of the Chernobyl Catastrophe**

1. Participants in eliminating the consequences of the accident at the Chernobyl AES shall be issued certificates and badges manufactured in accordance with a model approved by the UkSSR Council of Ministers for each category of citizens

2. Victims of the Chernobyl catastrophe shall be issued certificates drafted in accordance with models approved by the UkSSR Council of Ministers for each category of citizens

Minor children shall be issued certificates on general grounds, which shall be given to their parents

3. Certificates shall be changed in accordance with category changes.

4. The "Participant in Eliminating the Consequences of the Accident at the Chernobyl AES" and "Victim of the Chernobyl Catastrophe" certificates shall be documents which shall confirm the status of the citizens who have suffered as a result of the Chernobyl catastrophe and given the right to the benefits stipulated in this law.

5. The certificates and badges shall be issued by ministries, departments, or oblast executive committees (Kiev and Sebastopol City) soviets of people's deputies.

The procedure for their issuance shall be determined by the UkSSR Council of Ministers.

#### **Article 65. Extending the Effect of This Law to Citizens of Other Republics Who Suffered As a Result of the Chernobyl Catastrophe**

Citizens of other republics who suffered as a result of the Chernobyl catastrophe shall enjoy all the benefits stipulated by this law should they become permanent residents of the UkSSR.

#### **Article 66. Changes in the Amount of Additional Payments, Pensions and Compensations Stipulated in This Law**

All specific amounts of supplements, pensions and compensations shall be increased annually in accordance with changes in the cost of living index and the increased minimal wage as determined by the UkSSR Council of Ministers.

#### **Article 67. Grounds for Terminating the Payment of Compensations for Living in the Territories of Condemnation and Unconditional (Mandatory) Resettlement Zone**

The payment of compensations stipulated in this law for residing in the territories of the zone of condemnation and unconditional (mandatory) resettlement shall be terminated by decision of the local soviets of people's deputies in the following cases:

Granting to individuals who should have been resettled housing in homes belonging to the state or public housing fund, the fund of housing-construction (housing) cooperatives, within the standards stipulated in the current legislation;

In the case of refusal of official offers (no less than three options) to resettle in another area or in another housing premise;

As of the moment of acquisition of housing or completion (in the course of the month) of an individual housing premise on a territory not contaminated with radioactive substances

### FRG To Help in RSFSR Project To Monitor Chernobyl's Effects

PM1905190191 Moscow SOVETSKAYA ROSSIYA in Russian 16 May 91 First Edition p.5

[Unattributed report: "Unprecedented Act"]

[Text] Preparations are being completed in the FRG for an unprecedented act which German specialists in the sphere of radiation medicine and ecology intend to carry out in conjunction with their Soviet colleagues this summer in areas of the Russian Federation affected by the accident at the Chernobyl Nuclear Power Station.

The plan is to carry out all the work in two stages. Between now and eight radiation monitoring vehicles will go to Russia at the end of May, in fact. They will gauge the amount of radioactivity in foodstuffs and the environment. They will be joined in mid-June by several mobile laboratories mounted on heavy container carrier (TASS). Each laboratory will have four sets of apparatus which will accurately measure the content of radionuclides in the human organism within a minute. Everyone who is screened will immediately receive a computer printout of the results of the measurements.

### Research Ship To Study Chernobyl Effects at Sea

UD190810591 Kiev International Service in English (UNEP/WHO) 14 May 91

[Text] The building of a research vessel for the Ukraine's Academy of Sciences has been completed at the Ilchevsk Shipbuilding Plant in Odessa. It will carry out hydro-ecological investigations in the water area surrounding the accident at the Chernobyl Nuclear Power Station. Ukrainian and Aust. firms voiced a wish to take part in equipping the laboratories of the research ship.

### Debate on Research Reactor Safety Outlined

PM1905190191 Moscow IZVESTIYA in Russian 14 May 91 First Edition p.5

[A. Imshin article: "How Safe Are Research Reactors?"]

[Text] Our newspaper has devoted a whole series of articles to the topic of research reactors. For example, IZVESTIYA was the first to publish details about how many military reactors there are on the capital's territory and about their safety level. And now we have obtained data on a nationwide scale about the quantity and quality of these instruments, which are of great importance for the country.

Atomic research reactors and similar experimental installations were built mostly in the fifties and sixties. Today there are around 100 of them. Most of them belong to the USSR Ministry of Atomic Power Engineering and Industry and also to institutes of the USSR Academy of Sciences (Gatchina) and the Academies of Sciences of a number of republics—Belorussia, Georgia,

Kazakhstan, Latvia, the Ukraine, and Uzbekistan. And also to Moscow and Tomsk educational establishments and to departmental enterprises of the USSR Ministry of the Petroleum and Gas Industry in Obninsk and the "Norilsknikel" concern.

Following our articles about research reactor incidents, particularly in connection with public alarm about the danger presented by nuclear reactors located in the capital, numerous questions have arisen. In the first place, R. Nikolskiy, chief of the Gospromatomnadzor [State Committee for Safety in Industry and Atomic Power Industry] section for scientific research reactors believes, violations affecting safety are exceptionally rare at installations of this kind. But it is too soon to be complacent.

Too soon, indeed. Thus IZVESTIYA (Nov. 88) reported that a serious incident occurred on the stand for the Gatchina which gave rise to controversial rumors. We were immediately accused of "whipping up emotions." We are now giving the floor to the specialists.

True, we were told following an inspection carried out by the USSR Gospromatomnadzor that as a result of the incident there was no threat of radioactivity contamination or danger to people's lives. Operations on the reactor were immediately suspended. The investigation established that "In the course of the summer (1988) repairs during transloading operations, as a result of a violation of the integrity of the assembly, a fuel element (containing approximately one gram of uranium) fell into a zone inaccessible to inspection. Subsequently, over a period of eight months, water carried fragments of this element along a pipeline into pumps and into the heat exchanger located inside the biological shield. Instruments registered an increase in the level of radioactivity." But this is exactly what we reported! I can claim (having visited various Soviet and Western research reactors) that this type of incident is the result of gross negligence. And the specialists' conclusion. Although this is the first such incident in 30 years of the exploitation of this reactor, it demonstrates the need for greater safety on all atomic energy installations, and particularly on research reactors.

Measures are (partially) already being taken. After the Chernobyl accident the operation of 11 reactors in the country was suspended. Additional safety systems were installed on them. Now, on the instructions of the USSR Gospromatomnadzor, reactors at the Kazakh and Georgian Academies of Sciences have been taken out of service because of their inadequate technical resistance to earthquakes, and the Belorussian Academy of Sciences reactor has been shut down for technical reasons.

But are all potentially dangerous installations being monitored by an unbiased (at least formally speaking) government? Also, the Gospromatomnadzor has no jurisdiction over reactors belonging to one of the USSR's most powerful departments—the Ministry of Atomic Energy, Engineering and Industry.



And I would like to say that the main legal lesson of Chernobyl has not been learned in our country—to this day there is no law on atomic energy, on the utilization of nuclear technologies, on monitoring and responsibility for this extremely important work. There is a multitude of instructions and other papers. But no law, and making people really liable for outrageous things and even developing the nuclear power industry in isolated, civilized conditions is not possible as matters stand.

Meanwhile the role of the law is growing, especially in connection with the transition to market relations, when enterprises' responsibility for safe working practices should be rising and departmental influence decreasing. In our case this applies also to research reactors which are dispersed among 14 departments. Some specialists deem it expedient to establish an association of research reactor owners whose main objective would be to pool efforts to enhance the safety of these installations and attempt to include ecological problems within the circle of interests of this organization.

When this commentary was ready to go into print, two newspapers arrived at the editorial office: The accident protection system had been activated on research reactor of Riga and Kiev and operations on them suspended. An investigation into what had happened revealed that in both cases there was no danger to personnel let alone the environment or the population. For the repeat: Even in an extreme and not very likely, incident on a research reactor during which radiation might spread outside the active zone, it could not cause a catastrophe comparable with Chernobyl because of the low power of this type of installation and the small amount of fuel which it contains. However, all this comes out as a reassurance than as a convincing argument that "machines" of this type require rigorous control and—this is important—unbiased monitoring.

### **Yakutsk Conference on Use of Nuclear Power in Far North**

*Editorial: J. of Moscow INTERFA in English  
—1991/06/15, Moscow*

Yakutsk has hosted at the initiative of Yakutian government a conference which involved scientists and specialists from the "Krasnaya Zvezda" Research and Production Association, Ministry of Nuclear Power Engineering, Soviet Academy of Sciences and Russian Academy of Environmental Protection.

Participants in the conference discussed the possibilities of building small nuclear power installations to provide the northern regions with electricity and heat.

Electricity supplies in the Far North are 4 to 5 times less than those in the adjoining areas, speakers said. Power-generating stations are costly and ecologically harmful. To gain the unified electricity supply system is difficult to implement.

According to participants in the conference, the biggest obstacle on the road to using nuclear power installations might be the negative attitude to nuclear power on the part of the local people. Such an attitude developed when the impact of 11 nuclear explosions conducted in Yakutia between 1975 and 1980 on the environment and human health had become public knowledge.

### **Finnish Report Finds Moscow's Northern Power Plant Ecologically Sound**

*914E00894 Moscow NEZAVISIMAYA ZEMLE in Russian 30 Apr 91 p.6*

[Article by Arkadiy Mironov: "Did the 'Northern' HEIS Come Clean Before the People? International Experts Make Their Pronouncement on the Subject"]

[Text] This is how Olli Laasanen, head of the IVO International Company's group of experts, assessed his work.

The USSR Chamber of Commerce and Foreign Trade selected the Finnish firm IVO International to evaluate the Northern HEIS [Heat and Electric Power Station] project from the point of view of the station's effect on the environment. The expert analysis was commissioned by the municipal council of the city of Moscow. We have also involved in this assessment the independent Finnish Institutes of Forest Research and Meteorology, and the National Council on Water and the Environment. As far as I know, this is the first Soviet energy power station whose technical design has been analyzed by a foreign company.

The Northern HEIS is designed to have three power-generating boilers, 11 hot water boilers, and three steam generators to serve its own needs. The total energy-producing capacity of the station is presently 30 megawatts and its heat-producing capacity is 300,000 at 30/30 large calorie/hr. It will be linked to the city. The HEIS will supply heat to residential houses in the northern part of Moscow. During last winter the temperature in residential houses of some districts dropped below the norm for that reason the condition has acquired an urgent character. However, the station will be located near a national park and a water reservoir and it has to be safe for the environment.

It was a complicated task. Not to consider the details with technical details. I wish to say that the 300-page evaluation materials cover 200 topics with 10 pages. All the experts have come to a satisfactory general conclusion about the project. IVO International has made the most computations of water treatment processes and slag recovery systems. They are in compliance with the strictest requirements. However, we also gave recommendations on how to improve certain parameters of the station performance and make them safer.

The Finnish Institute for Environmental Research, on the emissions of air pollutants from the Northern HEIS, has had a minimal influence on forest and on the population.

air in general. In fact, if the station is used to replace some small inefficient boiler houses with short smokestacks and if it makes possible the reconstruction of existing power stations, it will ameliorate the already rather polluted air in the northern areas of Moscow.

"It has been established that the water treatment system can function, in principle, as a closed circuit without any disposal of water at all. IVO International remarks, nevertheless, that water treatment should be given special attention as there is no previous experience of utilizing such a system.

"Among other things, we offered some suggestions in respect of using the land and preserving the scenery around the construction site. So, if the Northern TETS is built according to the latest designs of the Mosenergo-proekt [Moscow Design Institute for the Design of Power-Producing Projects] and to our suggestions, it will be one of the cleanest power stations in the USSR.

"Considering that the design employs a lot of new technology and know-how, the construction and operation of the station should be treated with special attention. On that condition it will serve as a reliable and harmless source of heat and electricity for the people of Moscow."

#### NEZAVISIMAYA GAZETA Commentary

It is hard to hope that a period has been put at the end of the long argument about the Northern TETS. It is more likely that the 200-page report from international experts is just another comma. Because now we can expect an attack from the opponents of the construction.

The "fighters" have learned each other's habits rather well—a year has passed since their first confrontation at a Mossovet [Moscow City Soviet] session. In any case, the most active deputies, whose pre-election programs included a shutdown down of the power station, did not doubt the positive results of the evaluation. They are expected to try to discredit the experts, to try to prove their dependence on the Soviet power-producing system. However, this move is fraught with unpleasant consequences, as the civilized Finns may ignore the political symbolism of the Northern TETS and simply sue the offenders.

There can be no doubts, however, that all the fuss around the new heat and power station has a purely political meaning. It is unreasonable from the economy point of view to fight for clean environment by shutting down important systems helping to support our life. If we follow that kind of logic, then we have to ban all automobiles in our capital instead of striving to lower the concentration of toxic elements in the exhaust fumes.

But still—why Finns? The intermediary of the deal—the Chamber of Commerce and Industry—gives two reasons for its choice. First, it is the similarity of climates. Second, unlike some other authorities in the field of energy—Austria, Germany, and Japan—Finland did not

put in a bid for the supply of water treatment equipment for the Northern TETS and therefore it may be considered a neutral country. Besides, it has achieved a certain success in ecology.

The expert analysis done by international specialists is an expensive commodity. According to the protocol, the USSR Council of Ministers paid 50,000 hard currency rubles to the Finnish side, and the Moscow Gorispolkom [City Soviet Executive Committee] paid 10,000 "wooden" rubles to the intermediary. Considering that the results of many months of work by highly paid experts were probably known beforehand, one can start wondering about the advisability of such expenditures. Professional designers had no doubts that professional experts would not find any flagrant violations, and amateur critics had no doubts that the former two groups would find a common language. But one has to find consolation in the fact that there are some remarks in the report which Mosenergo-proekt will have to eliminate if the construction continues.

Most probably, the next session of the Mossovet will again start a discussion about the future of the Northern TETS and this time it will be begun by the supporters of the project and not by its opponents. In spite of themselves, many of the deputies ran into the problems with heat supply in the houses where their constituents live. It took more than just a few cold days during this past warm winter. As they discovered, it was impossible to build new apartments without an additional source of energy. However, it is a bit more difficult now to go back to the positions of last spring: the TETS conservation project has been completed and work is already going on in that direction.

It is hard to forecast results of the debate which might be of great significance for the city: the layout of forces in the city parliament is far from clear yet. We only know that Mosgorispolkom Chairman Yu. Luzhkov feels more comfortable in economy than in politics and he is still deliberating over the Northern TETS project. Judging by some public comments made by G. Popov, he also thinks that last year's decision to suspend construction was too hasty.

#### Estonian Scientists Hold Conference on Energy Sector Development

914E0088A Tallinn THE ESTONIAN INDEPENDENT in English 2 May 91 p. 3

[Article by Lisa Trei published under the rubric: "Environment: Supplying Energy for Estonia's Future"]

[Text] On the fifth anniversary of the nuclear disaster at Chernobyl, hundreds of Estonian scientists gathered at Tartu University to endorse a resolution opposing the use of nuclear energy in Estonia.

The resolution was passed unanimously on April 26 at the end of a three-day conference on ecology and energy.

problems organized by the Institute of Ecology and Marine Research and the Institute of Zoology and Botany.

A three person delegation from Hiroshima, Japan, the site of the devastating atomic bomb blast in 1945, asked Estonian scientists to cooperate in exchanging information about victims from Hiroshima and the Chernobyl Nuclear Power Plant accident.

The conference, held every three years, attracted more than 400 Estonian scientists and one energy specialist from Lithuania. Seventy-eight lectures on subjects ranging from radiation in northeastern Estonia to pollution in rainwater were presented. The last conference in 1988 attracted attention because the question of opening new phosphate mines in northeastern Estonia was debated. That issue was the catalyst for the creation of the Popular Front and efforts by Estonia to break from the Soviet Union.

Andrei Koppel, director of the Institute of Zoology and Botany, said many scientists this year wanted to adopt a strong statement against nuclear power but in the end supported a government decision passed last year to delay any reconsideration of plans to build a nuclear power station until the 21st century. Scientists also asked the government to financially back programmes supporting nature conservation.

"We cannot stand the problem (of nuclear energy) but we cannot solve it ourselves," Mr Koppel said. "The people who are for nuclear power plants are professionals. Prove against have their common sense but no facts. We have to find strong arguments against it."

Mr Koppel said the resolution, passed by about 200 scientists who stayed until the end of the conference, considered the question of energy resources as a vital requirement for state independence.

"We should pay attention to environmental hazards," he said. "There is an urgent need to establish a project on utilization of renewable energy. This conference asks that the government finance this project."

Mr Koppel said the resolution will be presented to the government which last December established a commission charged with planning future energy needs and resources. Estonia exports 52 percent of the electricity it produces from burning oil shale to Latvia and the rest of the Soviet Union. In return it imports raw materials and other energy supplies at advantageous prices. Only 55 percent of Estonia's energy supplies come from oil shale. Scientists estimate that oil shale deposits will last another 40 years, but that the plants that process it in northeastern Estonia must be replaced within a decade. Mr Koppel said he wants the government to act quickly to find new sources of energy because the plants are inefficient and cause wide scale pollution.

Eero Mander, a scientist from the Estonian Agricultural Academy in Tartu, said only one other place in the

world, Lushan Province in the Peoples' Republic of China, burns oil shale for fuel. The resource can be better used to make synthetic resins and plastics.

"Oil shale is most useful as a raw material, not for combustion," he said. "We must save it for the future for the chemical industry."

### Israeli Firm To Help Establish Geothermal Power Stations

IA2105081791 Jerusalem THE JERUSALEM POST in English 21 May 91 p 6

[Report by Gaht Lipkis]

[Text] Ormat Turbines announced yesterday that it has formed a new company to establish geothermal power stations in the Soviet Union, in partnership with the Soviet energy institute Enin.

The new company is to use equipment produced by Ormat.

Ormat said it established the firm in order to export geothermal stations to the Soviet Union, and to import Russian technology used to fuel power stations with shale oil. Ormat has the exclusive agreement to bring to Israel the technology needed to take advantage of shale oil.

There are a large number of shale oil deposits in the Negev. Two Israeli companies, Parva (Energy Resources Development) and the Erez Electric Corp., plan to establish a power station that operates on shale oil fuel.

### Uzbekistan Uses Solar Energy at Power Station

UD2005203891 Moscow Central Television for Program and Orbital Network in Russian 13 May 91 20 May 91

[From the "Vremya" newscast]

[Text] The utilization of solar energy in the national economy is the subject of a report from Mukhtar Gamayev, our correspondent in Uzbekistan.

[Begin recording] [Gamayev] The unique facility, built on a hill in Parkent, in the foothills of the mountains. It is called Object of the Sun [Obyekt Solntse]. Six years ago, 62 heliostats have been mounted at right angles to each other, consisting of 190 facets, or special mirrors. A computer controls all the heliostats simultaneously. They are turned toward the sun all daylight hours, and catch 1,500 rays onto a giant concentrator. The power of the solar rays, reflected from the 24,000 mirrors, is gathered up and is focused on to one point, a furnace, where the temperature rises to over 3,000 degrees. Here superpure materials are obtained, rare, new, non-melting, composites and composites, which can withstand aggressive gaseous and chemical environments, with frequent fluctuations in temperature. This material is not seen out

What is interesting is the fact that at night the gigantic optic system is being used by astrophysicists for their own research. This is the biggest furnace in the world and so far the only one in the country. Its technology has been about 10 years in coming to our country. This gives rise to problems. Up until recently scientists received big orders from the military industry, but now conversion has come in.

Tell me, what are orders like today? [video shows reporter interviewing Pirmatov]

[I. Pirmatov, captioned as director of the Specialized Design Bureau of the Physics-Sun Scientific Production Association] We have full orders for the first half of this year. For the second half, we will have to look for more.

[Reporter] If you think about the ecology and the wise utilization of energy resources, then renewed resources, in this case, solar power, should not only create new materials, but also produce electricity and heat. That is where the future lies. [video shows massive building at top of hill, cutting to pan shot of the heliostats and workmen erecting one, shots inside the control chamber and some of the materials, further shots of the site] [end recording]

### Groups Agree To Establish Russian Green Party

LD2705192191 Moscow TASS in English 1540 GMT 27 May 91

[by TASS correspondent Mikhail Utvanskiy]

[Text] Leningrad May 27 TASS—Russia's environmental movements in Leningrad today agreed to set up a Green Party in the republic.

Two previous congresses of environmentalists failed to produce such a result, but this time supporters and opponents of the idea to set up the party on a parliamentary basis reached a compromise.

The congress's declaration said that the Russian Green Party supports a "technological perestroika in the industry."

The party aims to promote ecologically-safe sources of energy and wants to replace nuclear power stations, it said.

The Greens believe a market economy could make industries more efficient but is not a panacea for Russia's environmental problems.

"The transition period from totalitarian socialism to a market economy is characterised by weaker law enforcement," Alexandr Donin of the Leningrad Greens told TASS.

"In these conditions we plan to promote the creation of a law-based state, which will protect Russia's environmental riches," he said.

The new party's headquarters will be in Leningrad.

### Conservation Efforts in Kola Peninsula's Lapland Preserve Detailed

91W504244 Moscow PRIRODA in Russian No. 1 Jan 91 pp 34-46

[Article by Valeriy Edmundovich Berlin, scientific associate of Lapland Biosphere Preserve, ecologist and active member of USSR Geographical Society: "A Preserve in Lapland"]

[Text] Above the Arctic Circle, a hilly island in the very center of the Kola Peninsula, the Lapland Preserve was born. In 1936, just six years after its creation, G.M. Kreps, its organizer and first director, wrote: "Faced with the mighty onslaught of industrial development and settlement of the Kola Peninsula carried out by the Soviet Government, its virgin wilderness was forced to retreat." Clearly even Kreps could not have imagined the present rate of that retreat. Discovery of ore deposits at Khibiny, Lovozero, Kovdor and Olenegorsk, as well as those in Monchegorsk, Pechengskiy and several other rayons, led to the development of major mining and ore processing complexes. Surrounding the enterprises there gradually developed wide zones exhibiting degradation of the soil and ground cover, ranging from lichen decline to complete destruction of soils and the creation of technogenic wastelands. The Lapland Preserve found itself in a tight ring of major sources of airborne technogenic pollution. We will discuss its past and present, and also its future.

### Land of the Midnight Sun

The area of the preserve is not large: just 2,800 square kilometers, i.e. approximately two percent of the total area of Murmansk Oblast, though the preserve successfully and fully represents all the basic landscapes typical of the peninsula, with the exception of the coastal zone. The preserve's flora and fauna include not only the species of the European North, but also those of more temperate latitudes: the Gulf Stream in effect places this Arctic oblast squarely in the temperate climate zone.

Nevertheless, this is still the northern tundra, and a large part of the preserve's territory is covered with evergreen forests. There grey clumps of lichen hang from mighty fir branches, and the dark, almost black foliage of the evergreen trees is impenetrable and ageless. The deep silence is occasionally broken by the piercing cry of an owl, and the sharp scent of wild rosemary intoxicates humans wandering through the wooded swamp. The pine forests look completely different: bright, sun-filled, and in the summertime abounding in mushrooms and berries, they attract the large and small forest wildlife.

Tens of thousands of hectares are occupied by mountain massifs with rocky summits and gentle slopes. As altitude increases one vegetation zone succeeds the other. The lowlands and foothills up to 250-300 meters are the realm of the coniferous forests, which then thin out, with elfin birch forests taking their place. At an altitude of 350-450 meters one finds low growing bushes, dwarf



spruce and dwarf birches. Another 250-150 meters higher and there is not a single bush to be seen, just moss and lichen interspersed with mountain cranberry, whortleberry and partridge berry (dryad). And, finally, above an altitude of 700-800 meters lies Arctic mountain desert, a stony surface of loose rock covered in places with a thin carpet of lichens. The glacier which passed through the Kola Peninsula just 10,000 years ago uncovered outcroppings of basalt rock over three billion years old.

For animals in the mountain tundra one will see *sevdy*, the sacred stones of the Lapps, the cult of which was widespread throughout Lapland. There is one of them on Mount Yelutun, two kilometers from the preserve's headquarters. It is a monolith weighing many tons, resting on four stumps of bedrock. The narrow slit of light between the stone and the mountain creates an eerie, almost weightlessness, and it seems that at any moment the stone might rise from its resting place and fly away. The ancient inhabitants connected the *sevdy* with their ancestor worship cult; the Lapps venerated the sacred stones as protectors of their trades—hunting and reindeer.

The southern world selects the brightest colors when it colors the mountains of Lapland in the fall with the gold of birch, larch, aspen and sedge and the lush purple of the heather, and the Alpine bearberry. All this against a background of greenish-blue carpets of reindeer moss, interrupted by the narrow lines of deer trails. In this land where still not yet the slow decay which is so typical of northern latitudes, here the leaves scarcely have time to turn, the birch trees before one clear September night the first glimmer of the aurora borealis lights up the sky. In the morning hoarfrost appears on the ground, followed by a downy cover of pure-white snow.

At the lake Chuna there are many beautiful rivers and streams. The lake Chuna, stretching almost 25 kilometers along the northern slopes of the Chuna Tundra, is a popular fishing spot. In 1887 the northern, hilly shore of the lake, where the first trading post was built, and it was from there that the first of the preserve's expeditions set out. There are many fish in the cold, clear, greenish-blue lake Chuna, six of them species of salmon. The lake salmon trout in its traits and habits is in many ways reminiscent of the salmon, while the *kharius* is probably the most beautiful of the salmon family. In its spawning time, in its mating colors, it is as beautiful as a monarch butterfly: a long, elegant body, on top of which is a blue steel, the fins and tail dark blue against a brilliant backdrop of the dorsal fin, in shape similar to a shark's, like spots and reddish-brown stripes, and a subtle rainbow hue. And the pattern on its sides is unique. With elastic strokes of its long, muscular tail it will from time to time leap out of the water in pursuit of insects flying past.

For the fish, as pressure with forest, slip past beneath the cover of the boat motor, in the foggy mist in the

distance a mountain becomes visible: Sugar Head, its shape like that of a baby elephant with its long trunk in the water of the lake. Like silvery braids streams flow down from Sugar Head, some, leaping from the tops of cliffs, form curving waterfalls. Below, in the swampy lowlands, is an expanse inhabited by flocks of ducks and geese. Closer to shore nest the timid loons, and in the dead trunks of time-dried pines live eternally sleepy owls. From early spring through late autumn graceful swans can be seen on the lake.

The upper boundary of habitation by many animals lies approximately at the preserve's latitude: north of it you will not find the black grouse, yet it is only the beginning of the habitat of the tundra partridge and the polar fox. The northern boundary of the coniferous forests coincides with the boundaries of the northern lemming, the common adder, the lynx, the bear, the marten, the hazel grouse, the wood grouse and several other species. Among the fur-bearing animals commonly found here are fox, wolverine, Arctic hare and squirrel; ermine and squirrel often inhabit the forest's edges, engaging from time to time in petty theft and unpunished plunder.

The preserve is the only place in our country where it is possible to see the beaver in natural conditions in the daytime. The beaver is a nocturnal animal, yet here, where in the summertime the night differs little from the day, beavers come out of their lodges at any time of day.

There is no need for further description of the natural environment of this remarkable land: those who love and understand the North will not be satisfied with the words alone, anyway, and those prefer other climes might become bored. And this discussion of the preserve was not started for the purpose of describing its charms.

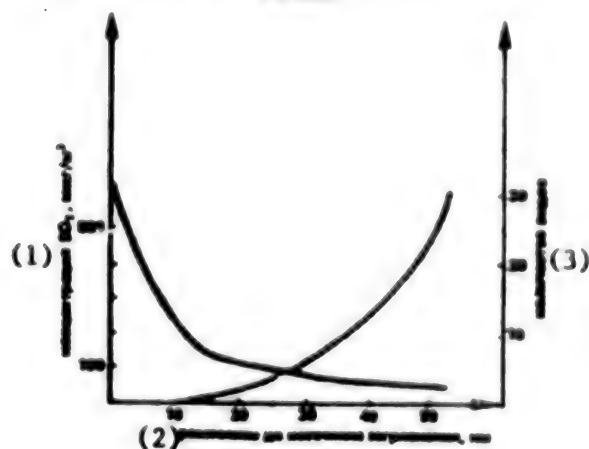
#### False Decisions of Various Scales

In the central regions of the Kola Peninsula, where mountain landscapes predominate, the wild reindeer was the main object of the inhabitants' hunting and the source of their livelihood. Even today in the preserve one can find snare pits overgrown with reindeer moss and crowberry. In the late 19th century, due to the development of reindeer herding and the shooting of many wild reindeer (there was a demand for their hides and their meat) their numbers began to decline rapidly. F. Pleske, the renowned zoologist, traversed the Kola Peninsula from Kandalakshi to Kola in 1887 and reported: "At Imandra, where in years past reindeer lived in incredible numbers, they are still found today, though constant harrying threatens either to exterminate them completely, or at least to drive them back to the most inaccessible regions." Indeed, 40 years later the situation of the reindeer was disastrous. The Murmansk Biological Station had already declared that "the only effective means of protecting the wild northern reindeer from complete destruction is the creation of a preserve."

For almost 10 years German Mikhaylovich worked toward that goal. A graduate of an agricultural institute



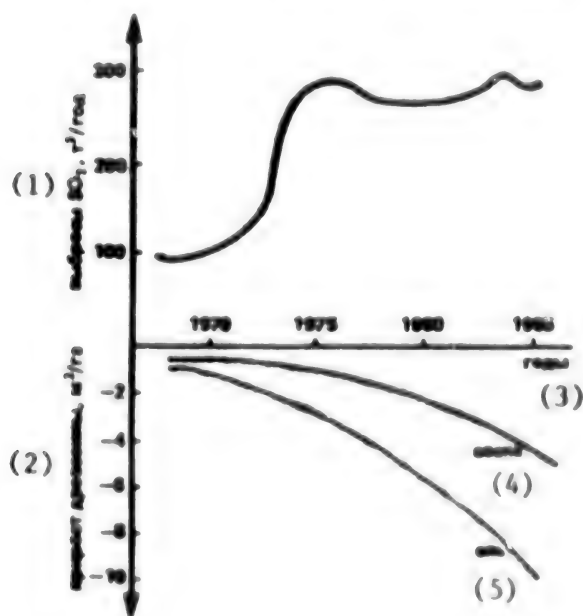
**Effect of Sulfur Dioxide Pollution in the Ground-Level Atmosphere on the Species Diversity of Epiphytic Lichens**



**Key:**

1. Sulfur dioxide concentration in milligrams per cubic meter
2. Distance to pollution source in kilometers
3. Number of species

**Effect of Sulfur Dioxide Emissions on Timber Growth Losses. (In the 1970's there was an increase in the concentration of sulfur dioxide in the combine's emissions, as well as an increase in the loss of coniferous timber.)**



**Key:**

1. Sulfur dioxide emissions in metric tons per year
2. Timber growth in cubic meters per year
3. Years
4. Pines
5. Firs

preserve. The increase in their numbers continued right up until the closing of the preserve in 1951. The drastic change in the conditions existing in beaver streams which subsequently occurred (i.e. flooding of low-lying areas and timber drives) was exacerbated by poaching. Only 20-30 beavers were left in the preserve, which is to say that their numbers had decreased by a factor of four or five. Today their Kola population—the most northerly beaver population in the USSR—is in critical condition and has been entered in the oblast's Red Book.

Fortunately, the time of plunder in the preserves, a time which did them much damage, came to an end, and in 1958 the Lapland Preserve was restored within its former boundaries. But now it was threatened by unprecedented global changes in the environment: in the neighboring Moncha Tundra a non-ferrous metals center was flourishing.

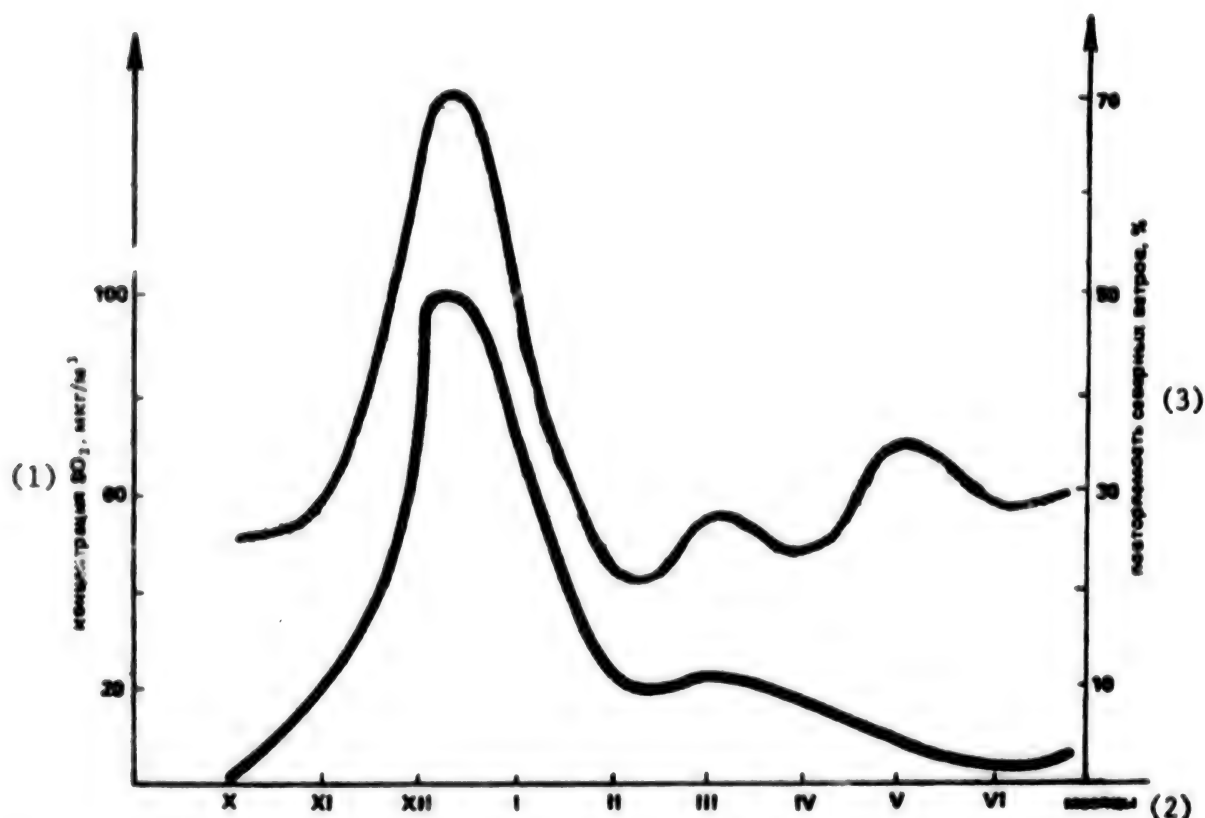
**A 'Most Beneficial' Neighbor**

Translated from Lapp, Monchetundra means "red tundra." A.Ye. Fersman once wrote: "Moncha is a remarkably beautiful mountain range on the Kola Peninsula... its slopes are washed by dozens of lakes, tumbling rivers flow down its stony sides, and virgin forests with grey reindeer moss cover the foothills, sheltering herds of wild moose and reindeer." This marvelous country was depicted in a description of the Zaimandrova Tundra by the first geological expeditions in the 1920's. Yet just two decades later the picture had changed markedly.

The year 1939 must be considered the start of pollution in the northeastern part of the preserve, which directly adjoins the industrial area of the Severonikel Combine: it was then that that combine produced its first output—fired nickel. In 1946, according to a report from preserve staff member P.M. Tyunin, the forests had already dried out over a radius of six kilometers as a result of emissions from the plant. Until the early 1960's none of the emissions were utilized, yet these emissions released along with technological and ventilation gases from the metal shops various sulfur compounds, metal-bearing dust containing extremely toxic oxides and sulfuric compounds of nickel, copper, cobalt and several other elements, as well as airborne hydrocarbons. It was not surprising that the preserve's "Chronicle of Nature" for 1964, 1967 and 1969 recorded significant changes in the composition of plant communities within a distance of 1-20 kilometers from the plant.

The emission of metals was so great that researchers unaware of the fact sometimes falsely reported the discovery of new deposits. The oblast newspaper published a commentary entitled "Fishing for Metal." "Last year (1965—editor's note) in the vicinity of Monchegorsk scientists from Leningrad University discovered an anomaly with a high nickel and copper content. In order to verify this discovery the decision was made to conduct major geophysical research and

## Effect of Meteorological Conditions on Pollution of the Ground-Level Atmosphere by Sulfur Dioxide Within the Preserve (in the Vicinity of Lake Chuna)



Key:

1. Sulfur dioxide concentration, in micrograms per cubic meter
2. Months
3. Prevalence of northerly winds, in percent

then to drill test wells." However, preliminary hydrochemical research on the "anomaly" indicated "that the cause was emissions from the Severonikel Combine, which was releasing a large quantity of nickel, copper and cobalt into the atmosphere." Thus no anomaly had actually been discovered.

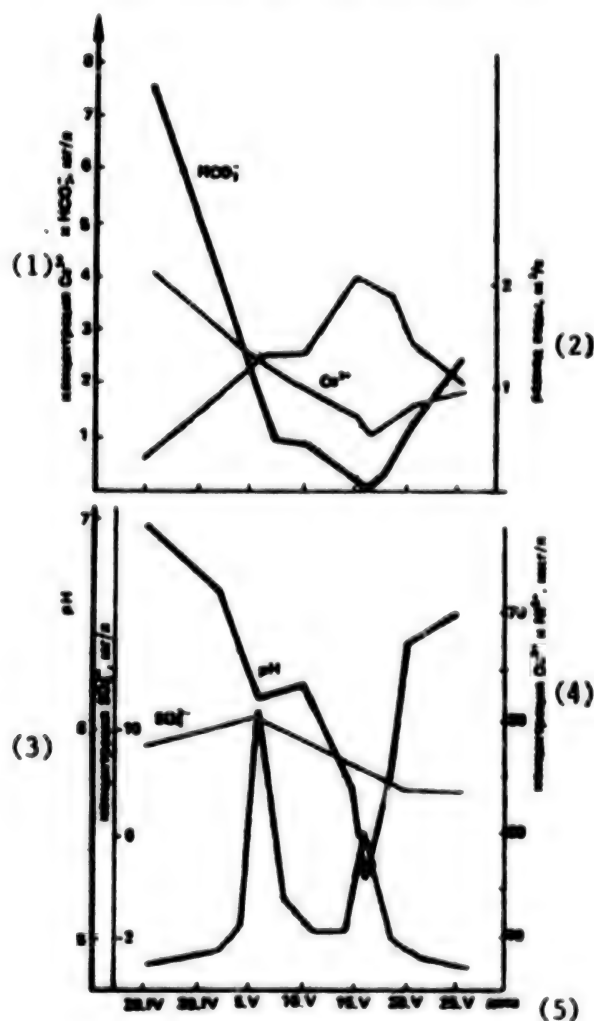
In 1969 scientists from the Arctic-Alpine Botanical Garden, noting the presence of heavy metals in the needles and leaves of trees, as well as in lichens and in the soil of various areas of the preserve, calculated the effect of pollution on plant life in the vicinity of Monchegorsk.<sup>9</sup> In needles collected in the zone of intensive pollution the heavy metal content reached 0.2 percent, and in lichen carpets was as high as 0.55 percent!

A.V. Donchev, a Moscow State University docent who headed a multipurpose expedition from the university's Department of Geology to the Monchegorsk region in 1971-73, asked: "Is renewal possible with regard to the

combine's effects?" His answer: "Yes, it is. Restoration of normal plant communities by natural means in the affected area is possible... within 500-800 years."<sup>10</sup> That is, if anthropogenic influence were eliminated altogether. Unfortunately that influence did not end; instead it intensified. In 1971 the combine went from the rich local ore which it had processed up until then to raw materials shipped in from other places, in which the nickel, copper and cobalt content was no less than that of local ores, but the sulfur content was two to three times as great. There was a corresponding increase in sulfur dioxide emission and release of other sulfur compounds. Yet clearly this was of little concern to the combine's owner, the Ministry of Non-Ferrous Metallurgy, otherwise what is the explanation for this disproportion: in 1975 only 20 percent of the sulfur compounds out of an annual total of 288,000 metric tons released into the atmosphere were being utilized, and 13 years later this figure had levelled off at around 50 percent, even though facilities for the production of sulfurous acid were only being used to



Changes in the hydrochemical balance of one of the preserve's streams at high water (above) and pollution of the surface flow. The concentration of calcium ions and hydrocarbons decreases, as they are spent in the binding and neutralization of sulfates, which accumulate in snow over the winter. Pollutants are washed into streams and rivers from the very start of the high-water season: at the beginning of May the concentration of heavy metal ions reaches a maximum; the water's pH decreases markedly, as the calcium-poor soils cannot fully bind the sulfates washed down with the thawing snow.



Key:

1. Concentration of calcium and sodium sulfate, in milligrams per liter
2. Water flow in cubic meters per second
3. Concentration of sulfur dioxide in milligrams per liter
4. Concentration of copper and nickel, in micrograms per liter
5. Dates: 29 April, 30 April, 5 May, 10 May, 15 May, 20 May, 25 May

70-75 percent of their capacity.<sup>11</sup> This meant losses for the country, but not for the ministry. What did it care about destruction of forests caused by air pollution, destruction which according to the State Hydrometeorological Committee was focused predominantly in the north, in the non-ferrous metallurgy centers, in the vicinity of Norilsk and Monchegorsk<sup>12</sup> (what sort of forests are there around Norilsk today?)

There were also increasing losses of metals discharged in the form of dust. In the 1960's the cost of annual losses was estimated by V.I. Guryevich (head of hydrochemical research on the "anomalies") as fairly modest: between R1 million [rubles] and R2 million. Yet 22 years later, according to V.Ya. Pozdnyakov (former chief engineer of the combine, deputy director for science and Lenin Prize laureate, presently retired), the total losses from higher than allowable emissions (note that this refers only to emissions above the permissible level!) of metals was approximately R18 million.<sup>13</sup> Clearly no further comment is required!

Between 1978 and 1980 our preserve attempted to impose sanctions on the combine: in conjunction with the timber industry it drew up scientifically-based fines for the damages caused to the preserve's timber industry in the amount of R2.5 million. Need we say how futile those attempts were?! In the meantime the combine continued to expand its capacity, at the expense of ecological interests. And seemingly as if to expand its area of influence it built 150- and 200-meter-tall smokestacks in places of its shorter ones to release production by-products. The area of pollution widened considerably: in 1971 the zone across which emissions were scattered was 30-50 square kilometers; in 1989 this area was 250-300 square kilometers. The preserve's southwestern regions, those closest to the Finnish border and long considered to be of exemplary purity, lost that quality.

A large contribution toward assessment of the combine's influence on plant life in the preserve was made by special studies; these studies used lichens and fir and pine needles as biological indicators. The circular nature of their life cycle, the longevity and the great sensitivity of lichens (an order higher than evergreen trees) to toxic substances makes them indispensable for biomonitoring (it was precisely on the basis of the lichen flora that a pollution map of the preserve was created<sup>14</sup>). It became clear that as one approached the pollution source first there was an increase in the number of epiphytes, then in their visual composition. As for coniferous species, their needles began dying at a sulfur dioxide concentration of 0.02 milligrams per cubic meter, a total metal concentration above 50 milligrams per kilogram and a sulfur concentration of more than 1,000 milligrams per kilogram<sup>15</sup> (see table). Damage to the trees is increased by secondary cold damage: clearly by affecting the needles pollutants destroy them or significantly reduce their ability to withstand cold. This accelerates the death of coniferous trees.

The combine's emissions are carried by the wind; therefore it is very important to analyze the meteorological situation in order to understand the fate which is in store for the preserve. The author of this article has for many years been measuring the concentration of sulfur dioxide in all directions of the compass from the preserve's central settlement, i.e. 40 kilometers from the Severonikel Combine. It turns out that near the surface a large quantity of sulfur dioxide is carried by northerly and northeasterly winds (in overcast weather), which carry smoke from the combine and most often blow in the winter—in December 1988 they prevailed in the Lake Chuna area 65 percent of the time. This immediately had an effect on the sulfur dioxide concentration: it reached a record high, 1.5 milligrams per cubic meter. The aggregate effect of the pollutants is resulting in ever-greater losses of timber each year, and the annual growth of timber is becoming ever smaller. According to some assessments such losses over a 15-year period have been 10-12 cubic meters per hectare.<sup>16</sup>

In order to explain the specific characteristics of airborne technogenic influences on the hydrochemical makeup of bodies of water, scientists from the preserve in conjunction with the Environmental Protection Laboratory (city of Apatity) have for years been studying the chemical composition of the snow cover and surface waters at the end of winter and during high water in several major rivers and streams which feed into Lake Imandra and Lake Chuna, i.e. at a distance of 20-40 kilometers from the combine. In the wintertime the mineral content does not exceed 30 milligrams/liter, but the snow is heavily polluted with heavy metals, and its pH varies from 3.9 to 5.1. The ion composition of the water during high-water season essentially reflects the composition of the snow melt, and pH ranges from 7.5 to 5.2 depending on the flow of the water: the greater the flow, the more acidic the water. Soils in the observation area are poor in calcium, therefore they possess little buffering capacity against acid rain. At the beginning of the high-water season the acidity of the water changes little through the action of neutral hydrocarbons, but later the pH decreases markedly (the "acid shock"), with an irreversible effect on the flora and fauna. The same thing occurs during heavy autumn rains.

The concentration of nickel and copper at the peak of the high-water season is more than 20 times higher than the total at low water, with concentrations of the basic cations (sodium, potassium, calcium and magnesium) decreasing as the water flow increases, i.e. simply becoming diluted. According to data from ichthyologist I.A. Paraketsov, water pollution has greatly weakened the composition of aquatic plant life and the small invertebrates which are the main food source for fish; as a result they do not spawn every year, and their fertility is low. Those are the most characteristic traits of these bodies of water. Mouse-like rodents which live in the vicinity of these zones have lost one-third of their species diversity and 80 percent of their population. Those that remain have excessive accumulations of heavy metals in

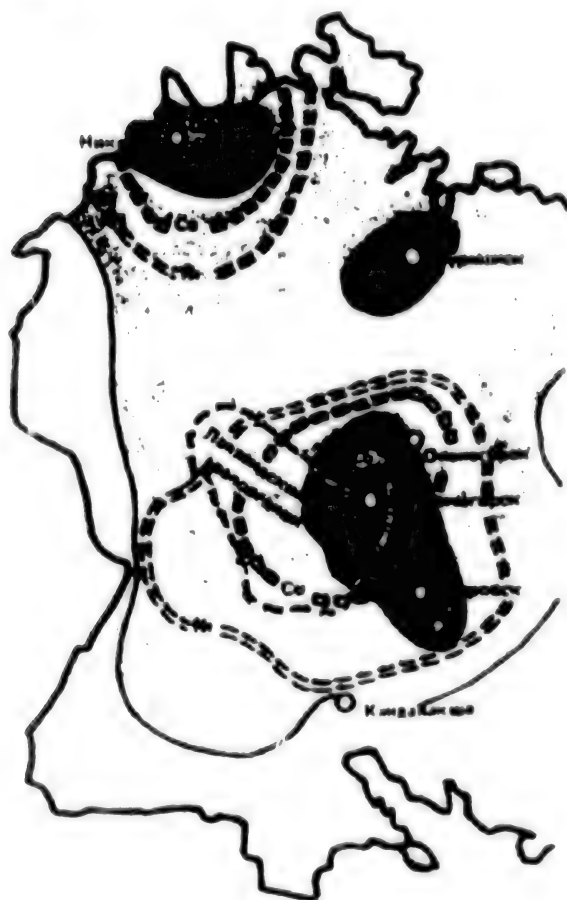
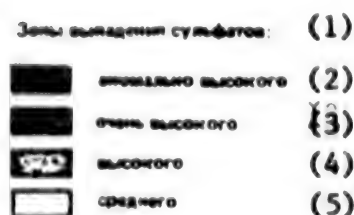
their internal organs, a reduced hemoglobin content in their blood, genetic disruptions and retarded sexual maturity.<sup>17</sup> The pathological deviations found among birds are largely similar.

Study and compilation of soil, botanical, biological and several other types of research over various years, analysis of the preserve's "Chronicle of Nature" and study of the characteristics of industrial emissions over time lead to this unhappy conclusion: the natural flora and fauna within a radius of 30 kilometers from the plant is definitely beginning to die and will degrade definitively within 20-25 years.<sup>18</sup> In the 1970's it became clear that it was impossible to maintain the preserve within its existing boundaries, and that in order to extend its life it would be necessary to expand its northwestern portion, which had not yet been affected by the trails of smoke from Severonikel. Things got moving only in 1980 after an article by preserve scientist O.I. Semenov-Tyan-Shanskiy was published in PRAVDA under the title "Smoke Hangs Over the Preserve." However, the Murmansk Timber Association quickly mobilized its forces to cut down the forest: three years later, by the time the preserve was expanded (on the condition that heavily pollution-damaged forests along the eastern border would be cut down), many hundreds of hectares of pine forests were already gone. By an ironic twist of fate, at the beginning of 1985 the one-quarter-devastated preserve was given the rank of a biosphere preserve and placed under the "shelter" of UNESCO.

When discussing environmental disasters one must note that they are always accompanied by degradation in people's health. Human beings cannot adapt to such major changes in the environment; environmental adaptation is the initial phase of illness or mutations. According to data from the Health and the Environment Information Service under the USSR Ministry of Health, the rate of illness in the portion of the population monitored in Monchegorsk in 1983-85 increased by 64 percent, with three-quarters of the illnesses consisting of respiratory problems. Biochemists who have autopsied the lung tissue of residents of Monchegorsk note its unnatural brown color and high content of heavy metal.<sup>19</sup> The area shows a particularly high rate of skin diseases among children (it is first in the USSR in this category).

Millions of cubic meters of untreated industrial waste water has for decades been polluting the pearl of the Arctic: Lake Imandra, from which drinking water is drawn. The large number of heavy metals in the organisms of Imandra's fish makes them unacceptable for human consumption, just like the mushrooms and berries picked within a radius of 30 kilometers from the Severonikel Combine. The zone to which sulfates, nickel and copper extend in the vicinity of Monchegorsk reaches almost 100 kilometers from the combine, and the areas with pollution of the snow cover and vegetation greater than the background pollution by a factor of at least 10 for these metals are, respectively, 10,000, 12,000

Diagram of Airborne Technogenic Pollution on the Kola Peninsula



Key  
1. Zones of sulfate deposition  
2. abnormally high  
3. very high  
4. high  
5. average

and 13,000 square kilometers, i.e. approximately 16 percent of Murmansk Oblast.<sup>20</sup>

The problem of preserving the environment here, as in many other places in our vast country, has become a question of survival for both human beings and nature.

Unfortunately crimes against the environment have still not been given a separate heading in our Criminal Code; there is no clear-cut list of standards establishing liability for specific types of encroachment on the environment.<sup>21</sup> That is why the infamous "maximum permissible concentrations" can be exceeded by factors of tens, hundreds and thousands; the guilty parties are even encouraged to do so, if their output meets their plan goals. True, since 5 January 1990 the USSR Council of Ministers approved a decree imposing fines on 50 cities for higher than allowable emissions of pollutants into the atmosphere. Oddly enough, Monchegorsk did not make the list! Was that perhaps because thus far no maximum permissible concentrations of emissions have been established for the Severonikel Combine?

At the beginning of last year the first Soviet document was published in which systematic data on environmental quality were made public. The Kola Peninsula was mentioned in it almost more often than other places which, to put it mildly, are not in the best of shape<sup>22</sup>, and all because economists and politicians evidently feel that ecologically clean production is not profitable because of the expenditures required to acquire and operate modern low-waste and energy-conserving technologies. USSR Supreme Soviet deputy A.V. Yablokov has suggested using convertible currency primarily for these needs, but to all appearances little attention is being paid to the environment or human beings yet. Twenty years ago the West realized the environmental pollution consequences which it faced, and today the most developed countries—despite our perception of "their morality"—are models of a thoughtful attitude toward human beings and the environment.

On 7 April of last year Soviet television broadcast a discussion by Soviet and Finnish scientists who described the situation on the Kola Peninsula and declared that an ecological disaster is imminent there. Will this wounded corner of the Northern environment continue to exist or not? It is criminal to wait for time to provide an answer to that question; action must be taken.

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#### **Kazakhstan Campaign Protests Semipalatinsk Testing**

OW2405152591 Moscow INTERFAX in English  
1800 GMT 22 May 91

[Text] In an appeal to the Supreme Council and the people of Kazakhstan on May 22, the "Nevada-Semipalatinsk" antinuclear movement called for preventing the renewal of nuclear testing at the Semipalatinsk testing site. This appeal was launched in connection with the proposal by the Ministry of Defense and the Ministry of Nuclear Energy and Industry of the USSR to carry out three last tests at the Semipalatinsk site (including two of 20 kilotons each and one of 0.5 kiloton) and the draft decree of the President of the USSR on the end of testing on the Semipalatinsk site effective from January 1, 1992.

The "Nevada-Semipalatinsk" antinuclear movement states that "the popular moratorium which went into effect on October 19, 1989 has influenced the global disarmament policy. The world has come to believe that a zero nuclear parity is a reality".

The address reminds of the article in the Declaration of Sovereignty of Kazakhstan which bans the testing of nuclear weapons and other weapons of mass destruction on its territory. The antinuclear protesters also demand that a full compensation be paid for the 40 years of tests at the Semipalatinsk site without any preconditions.



A republic-wide campaign against the renewal of nuclear testing is to be coordinated from a "headquarters" set up in Alma-Ata at the initiative of the "Zheltoksan" (December) Social-Democratic Party. A column of demonstrators has begun to form that will march from Alma-Ata through the republic's most important cities, towns and villages towards Semipalatinsk. The march is expected to culminate in the blocking of the nuclear testing site from all directions.

#### **New Calls for Semipalatinsk Nuclear Test Ban**

LD2705192591 Moscow TASS in English 1533 GMT  
27 May 91

[By TASS correspondent Valentin Pavlov]

[Text] Activists of the Nevada-Semipalatinsk Movement have called on the inhabitants of the Altay region in southwestern Siberia to join their protests against possible nuclear explosions in the Semipalatinsk testing ground. The Altay region neighbours on Kazakhstan where the testing site is situated.

The movement's Siberian regional committee said in a statement released today that the USSR Defence Ministry was ready to reactivate the testing grounds after a two-year moratorium on nuclear testing.

According to data available to the movement, nuclear tests were carried out in Semipalatinsk only when winds blew in the direction of Altay. As a result the number of oncological diseases registered in the region is twice the number of those registered in the Semipalatinsk region. The degree of radioactive soil contamination in the Altay region is several times above the norm.

According to the statement, a few days ago negotiations took place between the deputy minister of nuclear power engineering of the USSR and the leadership of the testing site, as well as the government of Kazakhstan. The negotiations ended in a decision to carry out three 20-megaton nuclear blasts in Semipalatinsk in 1991.

The movement's committee said in the statement that the decision was tantamount to ignoring the interests of an entire region of the sovereign Russian Republic.

Movement activists sent a telegram to Russian President Boris Yeltsin and the government of the Russian Republic demanding that the inhabitants of the Altay region be promptly informed about the terms of the signed agreement and the Russian leadership's attitude toward this agreement.

If explosions at the Semipalatinsk testing site continue, the statement says, the Nevada-Semipalatinsk movement will be compelled to take extreme measures.

#### **Debate on Semipalatinsk Nuclear Site Dangers Explored**

OW2905082591 Moscow Central Television First Program and Orbita Networks in Russian 1900 GMT  
19 May 91

[G. Sytykh video report; from the "Utro 120 + 30" program]

[Text] The Semipalatinsk Nuclear Test Site has been silent for the past year and a half. Testing has been discontinued temporarily, by popular demand. To be more exact, suspended. But, the acute problems connected with this test site remain unresolved. They are the subject of our correspondent Gennadiy Sytykh's report. [Video shows an open grassy field and some rusting girders]

[Begin recording] [Sytykh] This land has known no peace since 1949. Initially, the detonations were in the open, on the surface and in the air. This was particularly dangerous, like Hiroshima, only considerably more powerful. What about the people who lived nearby? [Video cuts to Sytykh standing beside a truck in the open field, reading from several sheets of paper]

Here is a statement by an eyewitness, Selimbekov: On the eve of the test, the population of the Abayskiy and (Abrolinskiy) Rayons were evacuated 200 to 250 kilometers from the test site. Forty of us were separated from the rest and left in the village of Karaul—this is not far from the test site. We saw the flash of the nuclear bomb, the huge mushroom-shaped cloud, felt the shock wave, and never even suspected how harmful it could be to our health. Two hours after the blast, the military took us to the mountains. There, they examined us with instruments. We were kept under observation for a long time." [Video cuts to an open field with cables running to, and disappearing into, what appears to be an underground entrance; a short mast-like object protrudes from the ground]

Now that a more or less safe technology has been found, for nearly three decades, nuclear devices have been detonated at a great depth underground. Here is the site of one such test blast. [Video shows close-up of the mast-like marker, then cuts to the city of Kurchatov and Sytykh talking with Major General Fedor Fedorovich Safonov, deputy chief of the test site, examining a radiation dosimeter in city surroundings]

Not far away is the city of Kurchatov, where the researchers themselves live. The radiation level is normal. The instrument shows normal background radiation levels, 10 micro-roentgens per hour. [Video cuts to Sytykh interviewing Maj. Gen. Safonov at the test site]

Well, Fedor Fedorovich, we are at the test site. What reading does the dosimeter show?

[Safonov] Fourteen micro-roentgens.



[Sytykh] Let us equate it with the standard, what would that be?

[Safonov] Well, if we speak of standards, then in the territory of the Soviet Union, four to 20 micro-roentgens is considered normal.

[Sytykh] In other words, that is a safe level of radiation.

[Safonov] Yes, a safe level of radiation. Now, in principle, in accordance with radiation safety standards, living is permitted in territories with levels of up to 60 micro-roentgens per hour.

[Sytykh] When the test site is in operation, does this level remain constant, or are there peaks from time to time when the radiation level rises?

[Safonov] There are occasions when the radiation level increases when gases are released, but that is for short distances, and in very small quantities.

[Sytykh] Is it dangerous to health?

[Safonov] No, of course not. [Video cuts to Sytykh interviewing B. Gusev, chief physician of the Semipalatinsk Radiation Dispensary, Candidate of Medical Sciences]

[Gusev] I can agree with General Safonov—I respect him and his opinions very much—that the majority of underground nuclear explosions, from the standpoint of radioactive contamination of the area, do not upset the radio-ecology or have any kind of harmful effect on the health of the people. But, I must reiterate that this concerns the majority of explosions, not all of them.

[Sytykh] How do you explain the fact that statistics tell us that, in certain categories of serious illness, Semipalatinsk Oblast ranks only fifth, and that everything here is supposedly alright?

[Gusev] An interesting question. The fact is that there was, and continues to be, controversy over this issue. So much so, that the Institute of Biophysics is even developing alternative concepts of our view that cancer—carcinogenic diseases are the gravest, the most serious long-term consequences of radiation damage—has not been affected by radiation. The fact is that ordinary statistics to which Fedor Fedorovich Safonov refers, take into consideration the aggregate population living in the region of Semipalatinsk Oblast.

If we separate the wheat from the chaff, so to speak, form separate groups of the irradiated population—children born from irradiated parents and who themselves have been irradiated, children born from irradiated parents who have not been irradiated themselves—and control groups, then the picture of carcinogenic diseases—let us speak only about this illness—changes drastically. Among people who were irradiated—true, these investigations covered only a small category of people, a small contingent of people—the cancer rate, over 30 years of

our observation, was 40 percent higher. [Video cuts to Sytykh interviewing Maj. Gen. Safonov]

[Safonov] I consider underground testing is ecologically harmless. The only thing which should be done here is to reduce the yield of warheads being tested. They should be less than 150 [kilotons]. [Video cuts to Sytykh interviewing K. Boztayev, chairman of the Semipalatinsk Oblast Soviet and first secretary of the Oblast Committee of the Kazakhstan Communist Party]

[Boztayev] This issue has been examined for the past two years. I can say that we are now at the final stage. Currently, the republic on the one side, and the military industrial complex on the other, are examining schemes to stop nuclear testing at the Semipalatinsk Test Site. I think this will be acceptable to us and to the military industrial complex. True, we are still divided on details. I think the near future will show... [changes thought] that this issue will be finalized in the near future. Now, I consider the issue of ending nuclear testing, has been predecided. There is another issue now. That is the elimination of the consequences of nuclear testing and the health of the population.

[Sytykh] Do you believe more investigative work and more commissions are needed to clarify, once and for all, the consequences of nuclear testing, its effects on health, and to specify measures to somehow eliminate them?

[Boztayev] No commissions are necessary. Six commissions have worked over the past two years. The materials are available. What we need to do now is to develop a program on the basis of the material we have now, and material which the military industrial complex must yet provide. [Video cuts to Sytykh interviewing T. Guseva, first secretary of the Kurchatov City Committee of the Kazakhstan Communist Party and an unidentified man]

[Sytykh] The test site has been silent for the past one and a half years. I think there must have been some changes wrought in the collective?

[Guseva] Naturally, and quite substantial ones. The number of people is being reduced. There are organizations which have been reduced to where only 30 percent of the people remain in them.

[Sytykh] What is the fate of the people who have left?

[Guseva] Complicated. Many of those who have left here now are scattered in many places in the Union and are working in jobs outside their fields. Those who have remained—highly qualified specialists, for example, involved in electrical engineering—are making cages for fur breeding farms. We have cases like that.

[Sytykh] It is disappointing.

[Guseva, interrupting] Yes, very disappointing.

[Sytykh] ...to use people in such a way

[Guseva] Very disappointing; therefore, the quicker the issue of the test site is decided—what will happen to it, and where it goes—the quicker the fate of these people will be decided. [Video cuts to Sytykh interviewing Maj. Gen. Safonov]

[Safonov] Two rayons of the Semipalatinsk Oblast have been subjected to radiation [dozovaya nagruzka] from the first nuclear explosion in 1949, and from the first thermonuclear blast. I think these people should receive the larger part of compensation. Compensation could be in rubles, or it could be mainly in the form of improving the standard of living of these people. [Video cuts to a diagnostic laboratory, containing a variety of modern medical equipment]

[Sytykh] Of course, a program of compensation and health measures demands substantial expenditure. Since the nuclear shield was created for the whole state, the expenditure for this program, particularly for the improvement in medical services, must be borne mutually and not only by Semipalatinsk Oblast. As elsewhere, there is a shortage of treatment facilities here. However, at the initiative of the oblast leadership, all possible measures nonetheless are being taken and health work has begun. A children's rehabilitation center and a diagnostic center have been built in Semipalatinsk. [Video cuts to Sytykh interviewing an unidentified official]

[Official] Our resources are not infinite. Of course, we pay more attention to the child population. Physically, we simply cannot offer such help to adults, because, what hinders us at present is that we do not have sufficient resources to allow us to provide additional rooms where we could have an out-patients' service. Out-patients' services would be particularly useful for this category of patient. So, the question of constructing an additional building for us is currently being decided. [Video cuts to medical personnel examining a child with the aid of electronic equipment]

We find that practically every one coming to us for examination is ill. Unfortunately, there is a high percentage of malignancies among them, and a weakening of the immune system among children. [End recording]

Such is the bundle of military, scientific, social, and medical problems surrounding the Semipalatinsk Nuclear Test Site. Of course, these problems are complex, but they need to be solved. You are aware that there is a Nevada-Semipalatinsk Movement. This movement is headed by writer Olzhas Suleymenov, a member of the USSR Supreme Soviet. So, the representatives of this movement intend to appeal to the Kazakh SSR Supreme Soviet with a proposal to organize a regional referendum among the populations of rayons which adjoin the Semipalatinsk Nuclear Test Site, on the issue of the three remaining nuclear explosions planned for this test site. The proposal to conduct the explosions came from Dmitriy Yazov, the USSR minister of defense, and Vladimir Konovalov, the USSR minister of atomic

power and industry. This was announced by Olzhas Suleymenov, the president of the Nevada-Semipalatinsk Movement.

### **Union, Republic Officials Debate Aral Sea Crisis Approach**

#### **Salykov Urges Republic Cooperation**

91WN0439A Tashkent PRAVDA VOSTOKA in Russian  
3 Apr 91 p 3

[Article by K. Salykov, chairman of the USSR Supreme Soviet Committee for Environmental Affairs and Optimum Use of Natural Resources: "Between the Lines of the Document"]

[Text] Decrees of the CPSU Central Committee and USSR Council of Ministers: "On Measures To Speed Up the Economic and Social Development of the Karakalpak ASSR," and then a similar solution for Kyzyl-Orda Oblast in the Kazakh SSR, "On Measures To Radically Improve the Environmental and Public Health Situation in the Region of the Aral Sea and To Improve the Efficiency of Use and Strengthen the Protection of the Water Resources and Land Resources in Its Basin"—have solved the immediate and urgent tasks of improving the public health, epidemiological, and environmental situation. However constructive the role of the decrees, they could not have produced very significant results. The personnel and resources were lacking, and new approaches to solving the problem are needed. The question of preserving and restoring the Aral Sea has not been put on the agenda at all.

The country's Supreme Soviet has now taken a new tack in resolving the Aral crisis. A formidable plan of action on the problems of the Aral Sea has been set forth in the decree adopted under the title: "On Progress in Carrying Out the Decree of the USSR Supreme Soviet entitled: 'On Urgent Measures To Repair the Country's Environment.'"

A government commission on the problems of the Aral Sea is now sitting, and scientific and production entities have been created. Followup on the decisions taken earlier has been greatly invigorated. Critical assessments have been made of the measures taken. There is no question that they need to be expanded and brought under a plan designed for the long run. That is why it was deemed essential to devise a long-range union-republic program for the period 1991-95 and the period up to the year 2005. The Aral problem has been given the status of a programmatic problem at the union level.

Every point in the decree except one is aimed at people's needs, man is placed at the center. One point is devoted to the general scheme for preservation and gradual restoration of the sea. This has decisive importance. A competition was held for project proposals involving Soviet and foreign specialists, demonstrating the great diversity of approaches and methods to solving the problem. The general scheme should absorb all that is

best from the entries submitted to the competition. At the same time, it must be realistic, and it must take into account the problems in the socioeconomic development of the republics of Central Asia and Kazakhstan and the new forms and methods of economic activity. The general scheme must be based on a synthesis of scientific knowledge and the practical experience of many countries in the world.

The world community, as represented by UNEP [United Nations Environment Program], has responded to the Aral problem. The USSR and UNEP are jointly developing a project entitled "Aid to the Soviet Government in Drafting a Plan of Action To Restore the Aral Sea." A team of international experts has been created to evaluate the conceptual developments and features of the project concerning the Aral problem.

In the work to develop the general scheme, particular attention must be paid to combating desertification of the region around the Aral Sea and also to seeking noncontradictory solutions in finding the necessary amount of water to maintain the level of the sea at its present stage and then to restore it. Maintaining the level of the Aral Sea at 37-38 meters is a fundamental issue. The reason is that at a lower level the sea breaks up into a group of bodies of water and finally loses its present characteristics.

Taking into account the increasing acuteness and very rapid deterioration of the environmental situation in the region, the USSR Cabinet of Ministers was given the assignment (the first stage of the long-range program) of approving within one month a union-republic program of urgent measures for 1991 and 1992. This effort is in the final stage. All the Central Asian republics and Kazakhstan have made their proposals. The government will soon complete this job.

The decree has paid its main attention to the needs of the inhabitants of the zone of the environmental disaster. We have reason to expect that the entire set of interrelated practical steps to restore people's health, to supply the population nutritious food, to combat degradation of nature, to save and preserve the region's gene pool, to restore the fertility of the soil and achieve optimum water use, and ultimately to restore the equilibrium of the Aral's ecosystem will be reflected in these programs.

The decree has recognized the need to draft within the long-range program a special section entitled: "Feeding the Population of the Aral Region." The low level of consumption of the principal foodstuffs (meat, milk, fish, and vegetables), combined with the poisoned drinking water, is one of the reasons for the rise in the morbidity rate, the tuberculosis rate in particular. Even plague and leprosy have not spared this long-suffering region. And no wonder! The drinking water contains pesticides, heavy metals, nitrates, and biogenic substances. There is no reliable sewer system or sewage treatment. Given those conditions, rural inhabitants and particularly mothers and children are above all at risk.

The decree calls for drafting a specific restorative medical program entitled: "Children of the Aral Sea." They must be embraced with particular concern, regardless of whatever economic difficulties there might be.

The problem of supplying good-quality drinking water to the population of the region has not arisen today, nor even yesterday. It has been timidly hushed up, as have all the other problems. To be frank, the problems of the drinking water supply can and must be solved far earlier, without waiting for the specific programs and decrees. For instance, taking the minimum allowance as the point of departure, the sick and children could be supplied water that is brought in from outside. We are placing great hope on the subprogram entitled: "Water Supply to the Population of the Aral Region," which is being prepared.

The measures of combating desertification, which are making headway, need to be discussed in particular. A new desert has already emerged. The people have given it the name Akkum—White Sands. It has managed to absorb about two million hectares of land, and every year conquers about 15,000 hectares of rangeland in the coastal zone of the Aral Sea. The dried-up bed of the Aral Sea is becoming one of the principal suppliers of aerosols in the earth's atmosphere. Specific measures and their sequence will be worked out and presented in the relevant section of the program. But one thing is obvious—there is an urgent need to stabilize the sand, using progressive methods of protecting and improving soils with plants. Sufficient world and Soviet know-how has been accumulated in this field. Creating a chain of lakes and bodies of water in the areas near the delta has become a very effective measure of combating desertification, making it possible, if only partially, to preserve small islands of surviving vegetation and to create the conditions for people to live.

The decree orders the USSR Supreme Soviet Committees for Environmental Affairs and Optimum Use of Natural Resources and for International Affairs, jointly with the USSR Ministry of Foreign Affairs, to request from the UNEP Administration that it help in drafting and carrying out projects to restore the Aral Sea and for inclusion of the problem of the Aral region in the UN Program to Combat Desertification. That is our ultimate aim.

But before turning to the world community for aid, we need to set our own house in order. To get rid of the confusion, mismanagement, and incompetence, to eradicate indifference, because otherwise no program will be carried out.

Order must be restored above all in water use. Someone has to be really in charge of land and water. The decree calls for enhancing the role and status of the basin water management associations "Amudarya" and "Syrdarya" in management of the water resources of the Aral Sea basin, and in 1991 turn over to them the organizations operating water management facilities, the water supply

installations, hydroinstallations, and storage reservoirs as was envisaged in the decisions of the country's government made earlier. A reasonable, but mandatory charge for water and fines for polluting it have to be established.

There is a great deal of gossip at present about the "Vodstroy" Concern. There is no doubt that it is supposed to be a cost-accounting (*khozraschetnaya*) organization operating as a contractor. The scientific-technical personnel of design organizations and the functions of managing water management associations and facilities are to be turned over to the State Committee for Water Resources, whose creation the USSR Supreme Soviet deems urgent to solving many of the problems of water management activity not only in the Aral region, but indeed in the country as a whole. (The committee's name is, of course, provisional.) The decree that has been adopted states: "It is recommended that the USSR Cabinet of Ministers and supreme bodies of state power of the union republics take up the question of creating a state administrative agency and assigning it the functions of interpublic distribution of water resources and monitoring water use in the country." We can hope that then there will be fewer disputes and suspicions of all kinds concerning the use of personnel and resources. We attribute particular importance in solving these problems to the leaders of the republics of Central Asia and Kazakhstan; their solid support through the Council of the Federation is necessary.

The normative basis for economic activity in the region needs to be essentially strengthened, procurators need to oversee more closely the enforcement of legislation on natural conservation, and land use and water use have to be put on a strictly scientific basis. In that regard, the USSR Cabinet of Ministers, jointly with the top state administrative agencies of the republics, have been given relevant orders, and they are reflected in the decree. The decision was also made to strengthen the scientific and information support of the region's socioeconomic development and coordination of the activity of the scientific research organizations of the republics of Central Asia and Kazakhstan. These problems simply will not be solved without specific interpublic entities.

The Institute for the Environment and Water Problems of the Aral Sea Basin of the USSR Academy of Sciences has been created for those purposes using the facilities of the Nukus branch of the "Aral" Scientific Research Monitoring Center. Its affiliates are being created in the cities of Kzyl-Orda, Tashauz, and Urgench.

The decree of the USSR Supreme Soviet on the problems of the Aral Sea will prove to be realistic if an interpublic agreement is reached on optimum use of the water resources of the basin of the Aral Sea, which the republics of Central Asia and Kazakhstan intend to conclude. Creation of interpublic government and scientific entities will mark a turning point in overcoming the Aral crisis. Only through the joint efforts of the center and the republics, the public and scientists, the entire country

and the world community is it possible to overcome the consequences of the environmental disaster and reestablish the region's destroyed ecosystem.

#### **Uzbek Official Stresses Siberian River Diversion**

91WN0439B Tashkent PRAVDA VOSTOKA in Russian  
3 Apr 91 p 3

[Article by V. Antonov, general director of the "Vodproyekt" Association of the UzSSR Ministry for Land Improvement and Water Management: "What Does the New Decree Offer?"]

[Text] Over the last two and a half years, three documents have now come down from the highest level of government on the problems of the Aral Sea and shown concern about a region suffering disaster. The decrees are multiplying, but still there has been no real help. The Committee on Questions of Ecology and the Optimal Use of Natural Resources, on the other hand, is "on the job" and is working, as they say, at full tilt. The last document went through lengthy and sound preparation by the committee. It was given various names, wordings were discussed and rewritten repeatedly, clearance was obtained from the republics (the authors failed to obtain the consent of Uzbekistan), and now they have sent it to the session of the USSR Supreme Soviet for its consideration.

I.Kh. Dzhurabekov, first deputy chairman of the Uzbekistan Cabinet of Ministers, expressed doubt in the session about the fate of the republic's proposals: "We do not understand at all for what reason they were not reflected in the proposed draft." Yet those proposals contained very important issues that were actually ignored by those who wrote the text of the decree.

I would like to ask K.S. Salykov if such an attitude is possible toward the proposals and requests of a republic located in the zone of the environmental disaster?"

The document adopted seems on the surface rather strict and sound. But let us examine what it offers for resolving this tight ball of socioeconomic, interethnic, and environmental problems of the region, of which the sea that is drying up has become a symbol. But is the sea the whole point?"

Half of the length of the decree is taken up by a recital of facts already known and copied from one document to another. To be sure, it has been bolstered and offered in sharper terms than has been done previously.

For instance, it is noted that the environmental situation in the region has gone out of control, a horrifying picture is sketched of the rapid deterioration of the climate, the rise in the level of aggressive groundwater, the disastrous development of the process of desertification, the death of orchards and vineyards, the ruination of structures and death of cultural monuments. All of this is presented exclusively as the result of the sea drying up. It is also pointed out that these processes are compounded as well



by the underdevelopment of the productive forces and the low level of the population's living conditions, both social and domestic. Wonderful! It turns out that the low standard of living is not a consequence, but one of the causes of the adverse processes taking place.

Much space is given to the "flagrant mistakes" that have been committed to the incorrect "selection of development strategy" and location of the productive forces made in the past, to the extensive conduct of economic activity, to the faulty practice of a "wasteful attitude toward water resources," and to oversights that supposedly have caused the large-scale salinization of the soil, and so on.

One wonders for whom all this was intended? For the ignorant person who knows about the problems of the Aral basin only from the articles of S. Zalygin and certain other writers whose efforts have shaped a distorted idea about the events taking place in the region?

Incidentally, a letter of S. Zalygin entitled: "Why and With What I Don't Agree" was recently published in IZVESTIYA. In it, he expounded his attitude toward the activity of the committee headed by K.S. Salykov and toward him personally, he commented on the decree which the committee prepared and which the USSR Supreme Soviet has passed on the problems of the Aral Sea.

Having in general offered a correct assessment of that document ("It is nothing but bureaucratic sweet talk and wishes addressed to no one in particular"), S. Zalygin at the same time goes on in his characteristic style to confuse the country's public about the causes of the Aral crisis. Once again he writes about the consumption of 44 km<sup>3</sup> of water for "overirrigation," the "write-off" of millions of hectares of irrigated land, he demands that "people in the Ministry of Water Management" be brought to criminal trial, and so on.

People have been persistently trying to suggest to us that the republics of Central Asia and Southern Kazakhstan have been experiencing all their troubles solely because of their own criminal mismanagement of natural resources, while in our water management and irrigation agriculture outright slovenliness has supposedly prevailed.

In their opinion, it turns out that it is sufficient to bring about elementary order in water use, to change the structure of agricultural production, to reduce the area irrigated, to restrict the disorderly taking of water, to lower artificial reservoirs—and immediately there will be environmental harmony, the ruined sea will revive, and, as a consequence of recovery of its initial level—the socioeconomic conditions of people's life will immediately improve all by themselves. How simple it all is, is it not? So the causes of our troubles lie in the level of the sea, not in the fact that the laws governing the economic development of the region so as to take into account its demographic and ethnic peculiarities have been ignored in our region for decades?

Is it incomprehensible that the development of an immense region characterized by extremely rapid growth rates of the population and limited resource potential should have gotten into a blind alley, that there is no way that we can get along without further development of irrigation, which is possible only through donor replenishment of the water resources of the exhausted Amudarya and Syrdarya? Without that, it is not possible for us to solve the food problem, nor the other complicated socioeconomic and interethnic problems, nor to ensure the sovereign development of the republic and restore the environmental situation to health.

By comparison with 1965, when the level of the Aral Sea began to drop at a fast rate, the population of Uzbekistan has more than doubled and today approaches 21 million persons. By the year 2010, the republic will have 35 million inhabitants, and throughout the entire Aral basin there will be 60 million persons, as against 30 million living here at the present time.

So, is it not concern about how to feed and clothe such a number of people, how to provide work and housing for everyone, how to bring about the necessary conditions for healthy life that should disturb our environmentalists first of all?

Yes, we have to explore ways of saving the sea. There can be no two ways about that. I think that there is not a man who could look indifferently on the death of the Aral Sea. Nor are there such people even among the water management personnel, the so-called "people from the Ministry of Water Management," whom they would like to represent as enemies of nature. Preserving the sea to ensure balance in the region's ecosystem is a matter of immense importance—but who is arguing with that? But it turns out that the committee headed by K.S. Salykov is pushing concern for human beings into the background.

Where in the new document is there any check on progress in carrying out the decree adopted earlier? Where does it express concern about the fate of the future socioeconomic development of the republics located in the Aral basin? How does it propose to guarantee development of the productive forces, employment of the population, and solutions to other problems?

How can the question be raised of reducing the area irrigated, when in Uzbekistan today there is 0.21 hectare of irrigated land per inhabitant (0.3 hectare is required for normal support of life)? And what will it be in 20 years?

Water is needed not only for the Aral Sea, but also for the region's industry and its fuel and power complex which are developing, it is also needed to satisfy the growing needs in the sectors of household drinking water and water for municipal purposes, to water the degraded deltas of the Amudarya and Syrdarya, to grow forests, to develop the raising of fish in lakes and ponds, to increase the productivity of pastures, to maintain the sanitary condition of our rivers, and for many other purposes.



Where is it to be obtained?

Why has the command-administrative veto still not been removed from the idea of adding some water from Siberia to the Amudarya and Syrdarya, which need it so badly? Why is the return to this idea regarded as sedition? When we all finally understand that we have no other way...

In 1989, as is well-known, an all-union competition was announced for developing the general scheme for recovery of the Aral Sea. The deadlines for the competition passed, but the results were never made public. And questions have been arising. First, it is not clear why the idea of the competition was reduced only to seeking ways of restoring the sea, and why it was not extended to solving all the problems of environmental recovery and further harmonious development of the entire Aral region? Second, why from the more than 200 proposals submitted to the competition were those that argued the need to supply additional water to the region immediately eliminated and not examined at all?

Think about it, can it be that the more than 200 proposals submitted, most of which came from rather competent specialists, did not contain anything reasonable?

And what is in the new decree? Again an order to draft in 1991 a general scheme for the "preservation and gradual restoration of the Aral Sea, linking it to the conditions for the socioeconomic development of the republics of Central Asia and the Kzyl-Orda Oblast of Kazakhstan."

To be sure, this time the writing is better thought-out, having taken a year and a half. It is no longer just a matter of restoring the sea at any price, but of a general scheme for its preservation and gradual recovery linked to ensuring the socioeconomic development of republics. Praise the Lord, they have finally understood in the committee that the problem of the sea needs to be linked to the prospects for the region's development, and that this must become a unionwide programmatic task

But there are still holes in the way this is written. One wonders why it is proposed that this general scheme be linked only to the interests of development of Kzyl-Orda Oblast, and does not Chimkent Oblast, for example, of Kazakh SSR, deserve this as well? Well, fine, we will not cavil. There still has been progress.

What is proposed in the substantive portion of the document? Steps are to be taken to increase the volume of guaranteed water supply to the sea. What steps is not clear. In what manner is it possible to increase the supply of water to the sea? That is not even mentioned, but it seems to be implied—by reducing the area of irrigation

And beyond that there is also no end of advice and recommendations.

It is proposed that another institute be created in the system of the USSR Academy of Sciences, that the role of the basin administrations "Amudarya" and "Syrdarya" be enhanced, that the question be taken up of creating in the country a state administrative agency for water resources (to replace the abolished Minvodkhoz, is that it?), and finally there is an order to the committee headed by K.S. Salykov to apply to the United Nations for help.

And that is all. One wonders whether the "valuable advice, recommendations, and wishes" that have been enumerated will help to solve the problem?

Specialists have calculated that restoring the health of the Aral basin, modernizing its water management and irrigation agriculture, will require about 100 billion rubles of capital investments. So, you will not be able to do it with advice alone.

The authors of the text of the decree have also skirted with graveyard silence the question of the need to divert into the region a portion of the flow of Siberian rivers. And where if not in this document is it to be noted that the ban on the design and construction of the "Siberia-Central Asia" Canal needs to be immediately removed, that there is no alternative to it, and that this is the only strategy for a fundamental solution to the tight tangle of problems?

#### **Uzbek President Wants Water From Siberian Rivers**

*PM2905084991 Moscow KOMSOMOLSKAYA  
PRAVDA in Russian 28 May 91 p 1*

[Unattributed report under the general heading: "In a Few Lines"]

[Text] Uzbek President I. Karimov has described as mistaken the decision to halt work to divert some of the Siberian rivers' flow into Central Asia and Kazakhstan. According to him, a meager water supply will cost far more. A water shortage is making itself felt even now

## DENMARK

**Industry Self-Monitoring System Under Attack**

91WN0419A Copenhagen BERLINGSKE AFTEN  
in Danish 27 Mar 91 p 4

[Commentary by Pernille Stensgaard: "Trust Is Good, But..."—first paragraph is BERLINGSKE AFTEN introduction]

[Text] Environmental policy. Because of the Proms affair, politicians have lost confidence in 25,000 Danish companies

Proms Chemical Industries is accused of falsifying its environmental reports to the authorities. It is the third Danish firm charged. And this time politicians are so upset and angry, and their confidence in Danish industry so shaken, that something is going to happen.

Proms has laid a bomb under the government's 17-year-old pledge of confidence to the worst industrial polluters: Self-monitoring—that they monitor themselves with frequent testing. It is cheaper for both sides. And 'agreement' has a better ring to it than 'policing.'

The affair involving Proms laboratory director, who was indicted, and his superior, cries out for more and stronger monitoring as well as the collective punishment of the entire group—the 25,000 companies who currently appear on the list of worst industrial polluters, and who are therefore responsible for monitoring their waste water or air.

"If cheating with the numbers is widespread in industry, we will have to reinstate old-fashioned environmental policy with loads of inspections," said Minister of the Environment Per Stig Moller to WEEKENDAVISEN.

"There will be enormous sums charged to the accounts of these companies. If the government is to be responsible for the monitoring, we will have to create a gigantic monitoring sector. This is a bomb under the whole modern system which emphasizes supervision and guidance rather than policing and punishing. It will be like Lenin said: 'Trust is good, but surveillance is better.'"

"The thing we can do, instead of overreacting and setting up a whole huge monitoring system, is to increase the penalties and make it very clear that you really lose by cheating. The original environmental sentence was too mild. It paid better to break the law than to uphold it," said the minister, who has asked his people to find out how many cases of cheating were dropped because they were too insignificant to go to trial. Afterwards, Per Stig Moller will reconsider the self-monitoring issue.

The Socialist People's Party is more adamant and suggests dealing with it in the same manner as dogs who use the wrong places at the wrong times: A firm hold on the muzzle and down goes the nose into the mess. The party wants the director personally to go out and clean up his

factory's mess. Educational community service for violation of the environmental protection law. And a ban on running that type of business in the future, if one is sentenced for gross violation of the law.

The Socialist People's Party wants penalties to be raised as well. And spot checks on industry's own testing should be increased.

The Social Democratic Party agrees with the demand for more spot checks and has called Environmental Minister Per Stig Moller in for consultation with the Environmental Committee in order to "put an end to the manipulation by industry of its own environmental monitoring."

At the same time, Justice Minister Hans Engell agrees with the Social Democratic Party on raising the maximum sentence for violation of the environmental protection law from one to two years. "Maybe it should even be more," said the minister, who advocates a new plan, the so-called 'Eleven Points Plan,' which would set up special training in environmental matters for specialized police and attorneys

Hans Engell wants prompt and continual contact between the police and the environmental authorities as well as a much tighter judicial monitoring through investigation of serious cases by the Environmental Board. The nation's six state prosecutors must get involved with the cases earlier and more thoroughly than before

En sum: Tightening up, more monitoring, stiffer sentences, harsher penalties. The entire Folketing has become greener and madder. Proms's Chemical Industries has set them on this road through openly abusing the proffered trust. The Progress Party, alone, is sticking by the current law

"I do not believe there are industries that willfully expel polluted waste water, and we must be careful not to make such harsh demands on our industries that they move abroad. Both the size of the penalties and the supervision we have today are sufficient," said Aage Brusgaard to BERLINGSKE TIDENDE. He is chairman of the Folketing's Environmental Committee

**Collective Punishment**

During the 17 years the environmental law has been in effect, three industries have been charged with falsifying their own testing results. Sentence was passed only twice, both times over the same company. Tarco, formerly Tjaerekompagni, in Nyborg

In 1988, a laboratory director of the company received a 30 days suspended sentence for falsifying documents. He had tampered with the company's own test results. Two years later, September 1990, the sentence was lengthened by 10 days in a new case for a similar incident. His supervisor was acquitted, the laboratory director confessed to it all.

The other indictment involved the fishing concern Pries & Co., which was charged with having given figures that were too low for the volume of the factory's waste water. The case is still in court.

And the third is Proms, which the police charge with having knowingly for years recorded low figures on its reports concerning pollutants in its waste water. The director and the laboratory director have been released but continue to be charged.

The question the environmental experts are asking themselves now is: Is the alleged cheating of three companies over 17 years enough to punish the whole sector? Will the environment be the loser in the end if the law is changed and self-monitoring is abolished?

Sources on the Environmental Board are afraid that the politicians are overreacting and will abolish self-monitoring all too hastily on account of the Proms scandal.

"There are no grounds for changing the law on self-monitoring, it will not be better for the environment," said engineer Tonny Christensen of the Environmental Board's industrial office, who conducted the Tarco case.

"For a company like Tarco that has its own large, efficient laboratory, it will cost double to call in an outside firm to do the testing instead of doing it themselves. I am afraid that the authorities will not dare impose the expense on the companies, and will, in consequence, cut down on the number of tests in order to keep the expense the same as before. In this way, the environment risks being the loser.

"It will be a collective punishment, which is particularly unreasonable for the numerous companies I know to run a very fine self-monitoring system."

Tonny Christensen thinks that the Tarco sentences are for themselves sufficiently deterring that a laboratory director or other technician has to be unusually stupid to tamper with results in the future.

"Self-monitoring is basically to set a fox to watch over the hens, but I believe that the risk for an engineer is clear enough to most of them. Or, in any case, it will be, the moment sentence is passed down on Proms."

#### Majority Behave Correctly

Poul Erik Sorensen, director of the Industrial Office, also does not feel that three is many in 17 years.

"It is not normal to cheat," he said. "The police are now investigating the Proms case and afterwards we will see if there is something about the system we can improve. But we cannot do much more than we have done already. It would be prohibitively expensive if the government has to pay for the entire monitoring program, or if companies have to pay for the testing instead of doing themselves. They do a systems control anyway in order to ascertain that the equipment is functioning, and it is

in order to utilize their resources that they also do the testing for pollution. It would be an unbelievably vast undertaking to reorganize the system, and it will be all of the other companies—the majority who behave correctly—that will suffer."

Officials from the district or community must make at various times during the year unannounced spot checks to see whether their figures tally with the company's own. One looks also at the operations record to see whether it shows a reasonable pattern.

There are 25,000 companies in Denmark who, in greater or lesser degree, monitor themselves. They have to be individually approved, and the authorities set up stipulations which the serious industrial polluters are required to maintain.

The technical director in the Storstrom district where Proms Chemical Industries is located has lost all confidence in the company, but Bent Fenger nevertheless urges the politicians to cool down. The Tarco judgments and Proms are not sufficient to abolish an excellent system and punish the rest of the sector.

"We do not revise the whole tax system because there are a few who cheat. We should not give up our spot checks, but, at the same time, self-monitoring is the backbone of modern environmental policy. Very likely there should be more of a deterrent when it does happen. And we have done that by depriving Proms of the right to self-monitor. It is happening for the first time in Denmark's environmental history."

Bent Fenger estimates the factory's new expenses for testing at 60,000-70,000 kroner per week. Previously, it cost only the salaries of its own personnel and material expenses. Now Proms has to bear an economic burden so large "that it will not be able to support it for very long."

"Try to imagine a company having to depend upon an impartial laboratory to do the self-monitoring over a long period. It would be so crushing that, on this ground alone, the company would not be able to survive. Therefore I am certain that the company will work to win our trust again—and its right to monitor itself."

#### FRANCE

##### Lalonde Proposes Industrial Waste Disposal Agency

91WN0436A Paris LA TRIBUNE DE L'EXPANSION  
in French 22 Apr 91 p 10

[Interview with Environmental Minister Brice Lalonde by Julie Chauveau and Sophie Seroussi; place and date not specified: "Brice Lalonde: France Must Acquire a Waste Disposal Industry"]

[Text] [LA TRIBUNE DE L'EXPANSION] French manufacturers have been seized by a sort of ecological frenzy over the last year. Do you see this as a fad or a strategic turning point?

[Lalonde] The psychological change over the last 10 years within both the public and companies has been profound. My feeling is that the big industrial groups, notably those that view markets from an international perspective, subscribe fully to the necessity of figuring the environment into their strategy. This was not the case a short while ago.

[LA TRIBUNE DE L'EXPANSION] What does that mean in practice?

[Lalonde] One example is that in Switzerland, the Migros supermarket chain is beginning to specialize in green products. This has become common practice in the United States. We are witnessing a real competition among manufacturers to see who can be the most ecological—somewhat like what we see in politics. I can only be pleased. But this praiseworthy effort must not fade like a passing craze. It must remain long term. It is an important step in the life of companies.

A certain number of new economic principles are going to become the rule in all industries. This will have both advantages and drawbacks: New markets will emerge, while others will change and even disappear. The transformation will be especially visible in service industries: cleaning, distributing, and manufacturing quality products.

[LA TRIBUNE DE L'EXPANSION] Are French manufacturers ready to meet this new demand?

[Lalonde] In France we are lucky to have manufacturers who are used to working with local collectivities. That puts us in a much better position than countries that have municipal services. Companies capable of proposing integrated services for city design and management that include environmentally-compatible transportation systems, water, public market places, slaughterhouses, etc., have nothing to worry about. They will be the ones who will win the new markets. In Japan, [cities] do not build incinerators, they build swimming pools heated with household trash. The future belongs to companies that show imagination. But the effort must not come from manufacturers alone.

[LA TRIBUNE DE L'EXPANSION] What do you mean by that?

[Lalonde] When it comes to waste, for example, our manufacturers are pretty good. On the other hand, there is no getting around the fact that a certain administrative flabbiness had set in over the last few years at all decisionmaking levels. For instance, there were no local officials in charge of industrial waste and household garbage. An entire, new organization must be thought out and put into place by local elected officials and the administration. They exerted themselves to collect the

waste and transfer it to a dump, now they will have to convert and treat it. The "waste" study that the prefects ordered all polluting companies to conduct, at the request of the Ministry of the Environment, should have the same impact on safety as the Seveso directive. Under public pressure, all companies will have to totally rethink their mode of production. The era of waste storage is over, we are entering the era of sorting and finding ways to add value. A full-fledged waste disposal industry is going to emerge. Already highly organized in North America, it is still at the teething stage in France.

[LA TRIBUNE DE L'EXPANSION] But the bill is likely to be stiff. Who will pay it?

[Lalonde] For waste, the government has already adopted the principle of taxing refuse deposits in dumping grounds. So have the local collectivities. The trickiest part is to establish true ecological prices. The OCDE (Organization for Economic Cooperation and Development) is working on it. I am also thinking of creating a sort of environmental INSEE (National Institute of Statistics and Economic Studies) as part of the new French environmental agency, to give me a more accurate idea of environmental indicators. Regulations are not enough: Economic incentives are also needed, either through fiscal measures, or polluter-pays taxes. But the very principle of "polluter pays" has to be rethought. Today, a new principle could be added to it—the principle of "taker restores."

[LA TRIBUNE DE L'EXPANSION] What does that mean?

[Lalonde] The quarry man who makes a hole fills it back in, preferably by planting trees. And in so doing, actually finds himself picking up the tab for restoring the site. The industry is not opposed, a priori. It is a matter of acquiring habits and establishing regulations. Another new concept to be promoted is the that of returning [waste products] to the supplier. For a certain number of products or raw materials, it is the supplier who will be responsible for recycling or getting rid of them. This is a good way to make manufacturers think about the problem of eliminating their products even before they manufacture them. Next to the production plant, they will have to plan for the destruction plant.

[LA TRIBUNE DE L'EXPANSION] Do you think you can win people over to your ideas?

[Lalonde] We absolutely must reach an agreement on the full circle of product life, from wrapping to the automobile. It is a collective brainstorming effort that all economic players must get started on. Waste recovery must no longer be left to more or less serious odd-jobbers. It is an industrial issue that must be handled rigorously and methodically, German-style. But with French flair.



### Environmentalists Criticize Fiscal Policy

91WN0414C Paris LE MONDE in French 25 Apr 91 p 30

[Article by Roger Cans: "Report on France's Nature Areas: French Fiscal Policy Does Not Favor Protection of Environment"]

[Text] The report on "Fiscal Policy With Regard to Nature Areas in France" requested of Mr. Guillaume Sainteny by the Ministry of Environment's Department of Environmental Protection was made public on Friday, 19 April. It specifically proposes exemptions for owners of wetlands who pledge not to build on or drain their land for cultivation purposes.

First, an observation: "French fiscal policy ignores the environment." Because of its agricultural traditions, France today finds itself trailing behind others in the protection of its nature areas through financial incentives. While Great Britain and Germany have already made extensive use of the possibilities afforded by celebrated Article 19<sup>1</sup>, France has only now signed the first contracts. In Great Britain 58,000 hectares have already been subsidized to allow them to lie fallow again or be used for "gentle" farming.

Countries like Denmark, Greece, and the Netherlands are already granting tax breaks to buyers of "clean" cars. In Great Britain the reduction of the tax on unleaded gas has afforded this fuel honorable status (over 30 percent use it), while the insignificant reduction of the French tax has kept the use of "green" gas at a few percent.

In Germany taxes are imposed on manufacturers who pollute rivers, with equivalent exemptions for those who equip themselves with treatment installations. In France a similar system was instituted in 1964 with the basin's financial agencies, but the "charges" are only parafiscal taxes and do not come under the heading of taxes per se.

### Negative Yields

But French fiscal policy appears to be most harmful to the environment in connection with undeveloped real estate since it encourages the transformation of nature areas into land used for intensive farming or building sites. In fact, the taxing of capital (real estate taxes and transfer taxes) is twice as hard on real estate as it is on floating capital. And it is harder on farmland than on building sites or construction projects.

As a result, an owner of nonproductive land (swamp-land, fallow land, natural forests) has every reason to cultivate it. As for an owner who leases his land to a farmer, he receives such a ridiculously low rent for it that it is in his interest to acquire the right to build on it. "Even before taking into account the effects of inheritance taxes, the net rate of return on a farm inheritance after capital gains taxes is negative in every case that has come up," the report asserts.

A comparison with our neighbors shows that "real property, particularly unimproved property, is generally more heavily taxed in France than it is abroad." In Great Britain and Ireland, farm and public parks are exempted from taxes. In Germany green areas and property belonging to public corporations are exempt. And owners of farm or forest land pay between 16 and 18 times less taxes than they do in France! In Spain slow-growing forests (leafy or mountain) are exempt.

To improve the French fiscal policy with regard to this, the report proposes that certain exemptions (for fallow land that is cultivated again, for example) and subsidies for drainage projects—already eliminated in the 1991 law—be eliminated. It, on the other hand, proposes that wetlands of major importance and protected nature areas be exempted and that landowners who restore a nature area be granted tax deductions.

### Footnotes

1. A Community measure that provides for the payment of subsidies to farmers who pledge to maintain the [undeveloped] land instead of using it for production.

## GERMANY

### Environmental Damage from Military Forces Detailed

91GE0213A Berlin DER MORGEN in German 28-29 Mar 91 p 21

[Article by Jo Angera and Manfred Krautter: "When the Troops Pull Out, They Leave Ecological Problems Behind: Neither Americans nor Soviets Obeyed German Environmental Laws; Who Pays the Bill?"]

[Text] The U.S. Army set itself up on 100,000 hectares in the west of the Federal Republic—a surface as big as the service and track area of the Deutsche Bundesbahn [FRG railroad]. Half of this is allotted to three large troop maneuver sites: Grafenwoehr, Wildflecken, and Hohenfels. The facilities of the U.S. Air Force and Navy are added to this. The activities of the U.S. Army during the past four decades left their mark on—and under—the occupied soil: ecological damage. It looks much the same in former GDR territory. Soviet military facilities cover four percent of the land. The soil is polluted and churned up nearly everywhere; ground water is poisoned. OEKOLOGISCHE BRIEFE [Ecological Letters] in Frankfurt/Main provided us with an inventory of the environmental disaster.

### Subterranean Dangers

In 1989, the U.S. military conducted an analysis of ecological damage for the first time. They arrived at 290 objectives, the official number of which has increased to 364 in the meantime; 146 of them are suspected areas of ecological damage. Seventeen so-called NATO Sofa

[Status of Forces Agreement] claims are added to this, i.e. ecological damage caused outside the purview of U.S. acreage.

According to Lothar Baldzun, environmental engineer with the U.S. Army in Heidelberg, 80 percent of the pollution is the result of improper storage and negligent handling of petroleum products (motor oil, transmission oil, heating oil, used oil, and propellants). The giant propellant and oil tank storage facilities, which are dug in deep and which are mostly older only single-walled models, represent a special threat. An additional 10 percent of the ecological damage is attributed to chlorinated hydrocarbons that escaped from chemical cleaning plants, repair and service facilities (especially, metal degreasing plants), or were stored in leaky tanks.

#### DM340 Million Renovation Expenses

The last 10 percent of ecological found is due to the Army's own disposal sites, pollution with materials jeopardizing water, storage tanks for special refuse and tainted solutions, used oil, used antifreeze, etc. Clean up costs are estimated by the Army at a total of 340 million German marks [DM]; there are no official or independent estimates.

If the individual instances of ecological damage based on the assessed expenses indicate the extent of damages, then five German locations top the list. Nuremberg: chemical cleaning plant, DM5 million; Mannheim: vehicle repair shop (chlorinated hydrocarbons), DM15 million; Germsheim: fuel storage facility, DM10 million to DM15 million; Grafenwoehr: disposal site, DM16 million; Mainz: maintenance facility, DM25 million.

For example, the city of Mannheim's drinking water supply is jeopardized because of a strong smell of chlorinated hydrocarbons. Some wells were closed, and others can only continue to be operated with expensive activated carbon filters—at the expense of water customers.

#### Laws Were Foreign Words

Actually, this damage should never have occurred because the Army is obligated by an executive order of the U.S. President to observe the environmental laws of the respective European host country. This degree of damage could hardly have come about if German standards—for example for storage of fuels, propellants, and solvents—had been observed. However, since regulations may not be monitored by local authorities, supervision is a matter for the U.S. Army alone.

Usually, only an incident causing damage demonstrates how much has been neglected here. The U.S. Army in Heidelberg is still attempting to absolve itself today by claiming that nearly DM1 billion have been spent since 1984 for environmental protection in Europe. It is not clear whether the amount is correct, because the U.S.

Congress that gives approval has only earmarked \$26 million for environmental protection measures through 1996.

#### Murky Waste Water Treatment Plants

Another area of ecological damage is the approximately 3,000-kilometer-long sewer network of the Army facilities. In 1982, the U.S. Army obligated itself in an agreement to regularly monitor the waste water system, which is several decades old for the most part.

The condition of the network, which was so desolate, became apparent and would have had to be renovated immediately at an expense of DM1 billion. However, the military is in no hurry here. They would rather leave renovation to German authorities and pay higher waste water system utilization fees. A comfortable agreement when your own withdrawal is foreseeable.

Regardless of the fact that partially untreated sewage is being flushed, the public knows nothing of the serviceability of the 15 sewage treatment plants operated by the Army. The Army is currently in the process of calculating its ecological damage and commencing initial cleanup. However, it is unclear who will pay for repair of ecological damage after withdrawal of the U.S. troops. Congress has previously shown itself to be very tight-fisted in financing measures to correct environmental damage. It will remain to be seen whether it will make money available for an army that is no longer present after withdrawal of the troops.

#### Not All Infractions Disclosed by a Long Shot

In response to a parliamentary inquiry by the SPD [Social Democratic Party of Germany] parliamentary group on October 9 of last year, the Federal Government responded that "no definite information is available for the facilities assigned to Soviet troops on the territory of the former GDR." Peter Petrowsky from the Berlin branch of the Federal Ministry of the Environment is proceeding on the assumption that there are 700 locations with suspected ecological damage. A working paper compiled in the former GDR by the old Ministry of Environmental Protection enumerates 90 of the worst contaminated locations. The authors make no claim to completeness. It must be feared that the entire extent of the military environmental pollution will only become apparent after the complete withdrawal of the Soviets. Twenty two of the locations mentioned in the paper are located in the Potsdam District.

Examples are: "The armor barracks in Alt Ruppin, discharge of untreated waste water and water containing oil into Ruppin Lake; Jueterbog: seepage into Drinking Water Protective Zone III; endangerment of water pumping stations in Jueterbog and Rehbruecke; in Wuensdorf (including the tank repair facility), discharge of insufficiently treated waste water, water containing oil and industrial waste from galvanizing plants, seepage of water pollutants, endangerment of the drinking water

supply for troop units and encroachment of the Wolzigersee and the Meilensee."

The "West Group of Soviet Forces" is divided into five armies and a few brigades and/or regiments and is present in the entire area of the new laender with air and land forces as well as a special concentration in the areas of Fruestenberg/Havel, Magdeburg, Eberswalde, Weimar, and Dresden. The Soviet forces utilize 2,300 square kilometers of military territory.

Three hundred eighty thousand soldiers with weapons and equipment as well as approximately 200,000 civilian employees are supposed to be brought back to the Soviet Union by the end of 1994. Renovation projects will remain behind: The West Group has more than 100 larger barracks with training facilities, 30 fixed wing and rotary wing aircraft landing strips, as well as 40 troop maneuver sites and training centers. Ten of these take-off and landing strips are longer than 2.3 kilometers

The land and facilities are utilized pursuant to the "Occupation Agreement," dated March 12, 1957 and the "Utilization Agreement," dated July 25, 1957. These agreements do not contemplate central registration of all Soviet facilities. For that reason, a general assessment of the structural condition of the objects to be vacated is difficult. A number of very complicated property issues are raised in conjunction with the transfer of facilities previously used by the West Group.

#### Approximately One Million Tons of Munitions

The disposition of weapons and munitions located in the arsenals of the West Group on German soil is especially touchy. One-hundred-fifty-six rockets—some with nuclear warheads—approximately 8,000 battle tanks, 3,700 artillery pieces, and 1,530 fighter aircraft have to be destroyed either in the Federal Republic or in the Soviet Union in accordance with the upper limits of the international disarmament negotiations.

Approximately 1 million tons of Soviet munitions are stored on German soil. The munitions, which are outdated for the most part, cannot be transported and must be destroyed on site. This raises financial and ecological problems. According to internal deliberations within the Federal Ministry of Defense, this will cost much more than DM3 billion. There is no experience in destruction of munitions on this scale to date. Between 1,000 and 2,000 tons of no longer usable Bundeswehr munitions have been disarmed and destroyed year for year in the "old" Federal Republic.

The 300,000 tons of munitions of the old NVA [National People's Army] alone consist of 532 different types of munitions, from illuminating flares to air defense rockets. Every type of munition requires a different procedure for destruction. The exact composition of the respective shells—especially of old munitions left behind by Soviet troops—is often unknown.

The only somewhat perfected procedure for destroying munitions is incineration, a technically very complicated process that requires expensive facilities. The Bavarian arms firm, Buck, has developed a test plant in the interim in which vapor and illuminating flares can be destroyed. The ordnance is incinerated in a closed chamber, and the highly toxic combustion gases are cleaned in a wet smoke filter.

#### Pumped Full of Kerosene

The problem of oil pollution is one of the biggest environmental problems on the ground of military sites in the former GDR. The soil is often so polluted with kerosene and other propellants and lubricants that waste management companies are already thinking about commercial reclaiming of these materials. Examples: Laerz military airfield in Mecklenburg; for years kerosene was pumped through corroded pipes here and seeped into the earth. Environmental experts estimate a total of more than 50,000 tons. At the Werneuchen military airfield northeast of Berlin 14 grams of kerosene per kilogram of soil were found. Letzlinger Heide training area: oil and other chemical materials seeped into an area that serves as a drinking water supply area for 450,000 people.

The soil and the environment are especially polluted in military training areas. They have often been used for military purposes for decades. Duds lying around prove to be just as much a problem as pollution of the soil with oil, heavy metals, or chemical decomposition products of expended shells.

The expenses which the new Federal Republic faces are not even estimable. Just cleaning one cubic meter of soil polluted with oil costs approximately DM300. Only one thing is clear: Not the initiator, in many cases the forces of occupation, will pay for restoration. The response of the Federal Government to a Federal parliamentary inquiry by the SDP on 9 October of last year stated: "If ecological damage becomes apparent after release of the facilities by the forces, the Federal Government will take the necessary steps to avert existing dangers to public safety and order." And that can be very expensive.

## ITALY

#### Rome Institutes New Emission Control Rules

91WN0463A Rome IL MESSAGERO in Italian  
15 May 91 p 2

[Article by Carlo Romano: "And Now Fines for the Polluters"]

[Text] Roman motorists must pass the "exhaust gas" test no later than today. By tomorrow municipal police will fine all the autos that do not have the little blue tag, that is, persons without proof of having been tested in authorized shops. The little tag is obligatory for gasoline powered autos registered before 1990, and only in zones

of the center with restricted traffic. (Persons not complying with the regulations will even have their historical center permit withdrawn.) On the other hand, diesel-powered vehicles are required to exhibit the little tag also outside the "blue sectors and zones," and must undergo a test according to a definite schedule.

It was the city government that imposed the requirement of checking exhaust gases. The aim is to reduce the pollution rate in the historical center, denying access to automobiles not in compliance. And there are very many shops qualified to carry out the tests and issue the little blue tag. (The list was published in our paper on 3 and 4 May.) They were overwhelmed with requests in recent hours and often had to extend their working hours.

"Very many are late," said the owners of an agency on Piazzale della Radio. "Many waited until the last few days to register on the waiting list. On the other hand, few cars fail to pass the test. Before coming to us, motorists usually have their cars overhauled by a reliable mechanic."

The requests have been so numerous that many agencies had to request new stocks of little tags. But here are the requirements, and the vehicles that must take the test.

#### **Gasoline-Powered Automobiles**

Only those registered before January 1990 are required to take the test by today. Persons who do not do it in time must carefully avoid entering the limited traffic zones until they can show the blue proof and thus avoid fines and withdrawal of the historical center permit.

FIAT will require no payment until 31 December for testing automobiles having the historical center permit. But the association of foreign automobile companies (UNRAE) will also provide free tests to those not in possession of the historical center permit.

#### **Diesels**

On the other hand, owners of diesel vehicles must have the exhaust gases checked in any event, even if they do

not enter into the center with their car. And automobiles registered before 1 January 1981 are required to do it by today. However, here are the deadlines for all other diesel vehicles: By 31 July, the ones registered between 1981 and 1982; from 1 August to 30 September for those registered in 1983; from 1 October to 30 November for those registered in 1984; from 1 December 1991 to 31 January 1992 for those registered in 1985; from 1 February to 30 April 1992 for those registered in the years 1986, 1987, 1988 and 1989. Finally, a repeat test is planned from 1-31 May 1992 for those already tested and found not to be in order.

#### **Checks by the GIT [Group for Traffic Intervention]**

Meanwhile, from 6 May until yesterday, municipal police of the Group for Traffic Intervention (GIT) have stopped and checked 118 diesel-powered vehicles on the streets of the capital. And with their mobile stations for checking the "cleanness" of the gas emissions (the so-called opacity meters), they have fined 42 vehicles. Of 41 vehicles tested, 18 were found to be in violation; of 77 trucks, 24 were polluters. The information was circulated yesterday by Pier Meloni, municipal police assessor.

"The percentage of polluting diesel motors," Meloni said, "is still too high, even if a slight improvement over the past has been noted. The fact is that despite campaigns promoted by the municipal administration, too many motorists refuse to obey the rules and contribute to city pollution. It will therefore be necessary to strengthen informational and preventive efforts. And the municipal police must be provided with more opacity meters. Now they have only three of them." Motorists found in violation by the opacity meter (a different case from the person without the little blue tag) must pay a fine of 25,000 lire and hand over their driver's license to the police. Only after having put their automobile in order will they be able to regain their license, but in the meantime the municipal police's report will be sent to the public prosecutor's office and it may apply a further penalty of around 200,000 lire.



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